This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Major, Municipal permit. The discharge results from the operation of a 54 MGD wastewater treatment plant with a future expanded flow tier of 64 MGD. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-05 et seq.

1.	Facility Name:	Upper Occoquan Service Authority (UOSA)	SIC Code :	4952 WWTP
	Facility Location/Mailing Address:	14631 Compton Rd Centreville, VA 20121-2506	County:	Fairfax
	Facility Contact Name:	Charles P. Boepple Executive Director	Telephone Number:	(703) 830-2200
2.	Permit No.:	VA0024988	Expiration Date of previous permit:	October 10, 2012
	Other VPDES Permits associated with this facility:		VAR051723, VAN010019	
	Other Permits associated with this facility:		Air - VSAPP No. 7770 EPA Sludge – VAL024988 Solid Waste – Industrial Landfill No. 542 Solid Waste – King George Landfill No. 586 Hazardous Waste – VAD 980716153	
	E2/E3/E4 Status:	Not Applicable		
3.	Owner Name:	Upper Occoquan Service Authority (UOSA)		
	Owner Contact/Title:	Charles Boepple Executive Director	Telephone Number:	(703) 830-2200
4.	Application Complete Date:	April 4, 2012		
	Permit Drafted By:	Alison L. Thompson	Date Drafted:	8/8/2012
	Draft Permit Reviewed By:	Joan C. Crowther	Date Reviewed:	8/20/2012
	WPM Review:	Bryant H. Thomas	Date Reviewed:	8/31/2012
	Public Comment Period :	Start Date: 11/16/2012	End Date:	12/16/2012

5. Receiving Waters Information: See Attachment 1 for the Flow Frequency Determination

Receiving Stream Name :	Bull Run, UT*	Stream Code:	1aXHL
Drainage Area at Outfall:	<5 sq. mi.	River Mile:	0.41
Stream Basin:	Potomac River	Subbasin:	Potomac River
Section:	7a	Stream Class:	III
Special Standards:	g	Waterbody ID:	VAN-A23R
7Q10 Low Flow (May-Nov):	0.0 MGD	7Q10 High Flow (Dec-Apr):	0.0 MGD
1Q10 Low Flow (May-Nov):	0.0 MGD	1Q10 High Flow (Dec-Apr):	0.0 MGD
30Q10 Low Flow: (May-Nov):	0.0 MGD	30Q10 High Flow (Dec-Apr):	0.0 MGD
Harmonic Mean Flow:	0.0 MGD	30Q5 Flow:	0.0 MGD

*UT = Unnamed Tributary

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

- ✓ State Water Control Law
- ✓ Clean Water Act
- ✓ VPDES Permit Regulation
- ✓ EPA NPDES Regulation
- ✓ EPA Guidelines
- ✓ Water Quality Standards
- ✓ Other *(Occoquan Policy 9VAC25-410)*

7. Licensed Operator Requirements: Class I

8. Reliability Class: Class I

9. Permit Characterization:

- ___ Private
- ___ Federal
- ___ State
- ✓ POTW
- ✓ TMDL
- ✓ Effluent Limited
- ✓ Water Quality Limited
- ✓ Toxics Monitoring Program Required
- ✓ Pretreatment Program Required
- ___ Possible Interstate Effect
- ___ Compliance Schedule Required
- ___ Interim Limits in Permit
- ___ Interim Limits in Other Document

10. Wastewater Sources and Treatment Description:

This 54 MGD facility utilizes conventional treatment followed by chemical and physical advanced wastewater treatment. The wastewater enters the facility and through mechanical bar screens, grit removal cyclones and classifiers, and then through primary clarifiers. The primary effluent is then pumped into the aerobic biological selectors and combined with the return sludge. The wastewater then enters the fine bubble diffuser aeration basins. The water is then sent to the secondary clarifiers.

From the secondary clarifiers, the wastewater flows to the chemical advanced wastewater treatment processes. The facility utilizes the high lime process for phosphorus and trace metal removal as well as for virus inactivation: lime slurry is fed into the wastewater in rapid mix basins, and the lime slurry is removed using chemical clarifiers and two stage recarbonation. Two-stage recarbonation (the pH is first lowered to 10 S.U. and then to a pH of 7.0 S.U.) provides a much higher quality effluent than single-stage recarbonation.

After chemical treatment, the wastewater is then processed through the physical advanced wastewater treatment processes. There are two process trains for this portion of the facility. The older portion of the train uses 12 horizontal multimedia pressure filters followed by 32 upflow carbon contactors and 8 post filters to remove any carbon fines. The newer section uses gravity multimedia filters, plus aluminum sulfate, followed by 8 upflow/downflow carbon contactors. The plant has a multi-hearth furnace to regenerate the activated carbon as necessary. The final process is chlorination using sodium hypochlorite and dechlorination with sodium bisulfite. The final effluent flows into the Final Effluent Reservoir before flowing into an unnamed tributary to Bull Run.

The application contains a detailed facility schematic/diagram.

TABLE 1 – Outfall Description

Outfall Number	Discharge Sources	Treatment	Design Flow	Outfall Latitude and Longitude
001	Domestic and/or Commercial wastewater	See Item 10 above.	54 MGD with a 64 MGD tier	38° 48' 19.0" N 77° 27' 31.7" W
See Attachment 2 for (USGS Manassas Quadrant, DEQ #205C) topographic map.				

11. Sludge Treatment and Disposal Methods:

The lime solids generated from the chemical treatment processes are pumped to gravity thickeners to concentrate the solids. The concentrated solids are then processed in recessed chamber plate and frame filter presses to dewater the lime sludge. UOSA has an on-site landfill for the lime solids.

The waste activated sludge solids are blended with the primary sludge and the combined solids are strained prior to thickening and anaerobic digestion. Centrifuges are used to dewater the solids; the centrate is returned to the headworks of the facility.

With the 54 MGD expansion, the facility installed a Berlie/Swiss Combi pelletizer system. This system has a rotary drum dryer and can produce 30 tons/day of Class A/EQ pellets. These pellets are bagged for distribution and are land applied by commercial businesses. The facility can lime stabilize the solids for land application if the pelletizer system is offline; Class B solids are produced. Synagro Mid-Atlantic is contracted to land apply the biosolids. Synagro has 35 land application permits (35 counties) under which the UOSA solids can be land applied.

According to the permittee's application, approximately 1,249 dry metric tons of sewage sludge are land applied in a 365-day period.

UOSA also has a permit with Waste Management's King George Facility for disposal of sewage sludge at the landfill during inclement weather. Approximately 173 dry metric tons per 365-day period are sent to this Facility.

12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge

TABLE 2	
1aCUB002.61	VADEQ Ambient Water Quality Monitoring Station on Cub Run at the Route 658 Bridge crossing
1aLIP001.00	VADEQ Ambient Water Quality Monitoring Station on Little Rocky Run at the Route 658 Bridge crossing
1aBUL009.61	VADEQ Freshwater Probabilistic Monitoring Station on Bull Run downstream from Route 28.
1aBUL010.28	VADEQ Ambient Water Quality Monitoring Station on Bull Run at Route 28 – approximately 1.3 miles downstream of the discharge.
1aBUL011.12	VADEQ Biological Monitoring Station on Bull Run at Route 616 –upstream of the discharge

13. Material Storage:

Materials stored at this facility are listed in Attachment 3.

14. Site Inspection:

DEQ-Compliance staff performed a Focused Technical Inspection on February 18, 2010. The inspection report and inspection response can be found in Attachment 4.

15. Receiving Stream Water Quality and Water Quality Standards:

a) Ambient Water Quality Data

The nearest downstream DEQ monitoring station with ambient data is Station 1aBUL010.28, located on Bull Run at the Route 28 Bridge crossing. This station is located approximately 1.3 rivermiles downstream from the Outfall of VA0024988. The following is a monitoring summary for this station, as taken from the Draft 2012 Integrated Assessment:

There are three DEQ monitoring stations in the vicinity of the discharge: DEQ freshwater probabilistic monitoring station 1aBUL009.61, downstream from Route 28; ambient and biological monitoring station 1aBUL010.28, at Route 28, and biological station 1aBUL011.12, upstream of Route 616.

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. Additionally, an exceedance of the fish tissue value (TV) of 12 ppb for heptachlor epoxide that occurred in one specie (flathead catfish) in 2001 at monitoring station 1aBUL010.28, noted by an observed effect. An observed effect is also noted for an exceedance of the fish tissue value (TV) of 110 ppb for total chlordane that occurred in one species (carp) in 2004.

Biological monitoring finds a benthic macroinvertebrate impairment, resulting in an impaired classification for the aquatic life use. A benthic TMDL for the Bull Run has been completed and approved.

The recreation and wildlife uses are considered fully supporting.

b) 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

The UT containing the discharge is not on the current 303(d) list, but there are two approved TMDLs (bacteria and benthic macroinvertebrates) for two impairments along segment VAN-A23R_BUL02A02.

UOSA has Wasteload Allocations (WLA) in the two approved TMDLs:

The Bacteria TMDL provides UOSA with a WLA of 1.11E+14 cfu/year for *E. coli*.

The Benthic TMDL provides UOSA with a WLA of 242.2 kg/day (97.42 tons/year) for TSS.

303(d) Listed:	Receiving Stream – No		
303(d) Listed:	Downstream – Yes (Benthic and PCBs in fish tissue)		
TMDL Approved:	Downstream – Yes (Benthic)	Date TMDL Approved:	9/26/06
TMDL Approved:	Downstream – Yes (Bacteria)	Date TMDL Approved:	11/15/2006
TMDL Approved:	Downstream – No (PCBs)	Date TMDL Approved:	Scheduled for completion by 2016

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal, and the 2010 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment. EPA issued the Bay TMDL on December 29, 2010. It was based, in part, on the Watershed Implementation Plans developed by the Bay watershed states and the District of Columbia.

The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries that are on the impaired waters list. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards has been identified. This aggregate watershed loading is divided among the Bay states and their major tributary basins, as well as by major source categories [wastewater, urban storm water, onsite/septic agriculture, air deposition]. Fact Sheet Section 17.e provides additional information on specific nutrient limitations for this facility to implement the provisions of the Chesapeake Bay TMDL.

The full planning statement is found in Attachment 5.

c) Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream Bull Run, UT, is located within Section 7a of the Potomac River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

Attachment 6 details other water quality criteria applicable to the receiving stream.

Ammonia:
Previous permits for this facility have not established ammonia criteria since the facility is located in the Occoquan Watershed and is subject to the effluent limitations contained in the Occoquan Policy. The Policy establishes a monthly average TKN limitation of 1.0 mg/L. It is staff's best professional judgment that when an effluent limitation for TKN of 3.0 mg/L or less is achieved, there is no ammonia present in the discharge.

Default values of 7.5 S.U. for pH, a year round temperature of 25°C, and a high flow temperature value of 15°C were used to calculate ammonia criteria presented in Attachment 6. These criteria and subsequent wasteload allocations were not used to establish any effluent limitations because of the TKN limit discussed above.

Metals Criteria:
The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/L calcium carbonate) as well as the hardness of the effluent. DEQ's Ambient Water Quality Monitoring Staff determined that the average total hardness for the VAN-A23R watershed is 113 mg/L. This average was determined using available data from the period 1-1-1990 to 2-28-2011. The hardness-dependent metals criteria shown in Attachment 6 are based on this value.

Bacteria Criteria:
The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 ml)	126

[1]For a minimum of four weekly samples [taken during any calendar month].

The Occoquan Policy at 9VAC25-410 establishes a monthly geometric mean of <2 N/100mL for regional facilities such as UOSA.

d) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Bull Run, UT, is located within Section 7a of the Potomac Basin. This section has been designated with a special standard of "g."

Special Standard "g" refers to the Occoquan Watershed policy (9VAC25-410). The regulation sets stringent treatment and discharge requirements in order to improve and protect water quality, particularly since the waters are an important water supply for Northern Virginia. The regulation generally prohibits new STPs and only allows minor industrial discharges.

e) Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched for records to determine if there are threatened or endangered species in the vicinity of the discharge. No threatened or endangered species were confirmed by collection within a 2 mile radius of the discharge. The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and therefore, protect the threatened and endangered species potentially found near the discharge. The results of the database search have been placed in the reissuance file.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1 based on the fact that the stream is in a highly urbanized area with numerous impairments for Bull Run in the area of UOSA's discharge. Also, the critical flows for the stream are zero and at times the stream flow is comprised of only effluent. It is staff's best professional judgment that such streams are Tier 1. Permit limits proposed have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development :

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are the calculated on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:
Effluent data obtained from the permit application and monthly DMRs has been reviewed and determined to be suitable for evaluation. Effluent data were reviewed for the past 3 years, and there have been no exceedances of the established limitations. The following pollutants require a wasteload allocation analysis: total residual chlorine.

b) Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- f = Decimal fraction of critical flow from mixing evaluation
- Q_s = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
- C_s = Mean background concentration of parameter in the receiving stream.

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent (e.g., total residual chlorine where chlorine is used as a means of disinfection) and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to the Outfall 001 discharge, total residual chlorine may be present since chlorine is used for disinfection. The priority pollutant scans completed as part of Application Form 2A did not have any pollutants that require further evaluation. Wasteload allocations are listed in Attachment 6.

c) Effluent Limitations Toxic Pollutants, Outfall 001 –

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Total Residual Chlorine:

Chlorine is used for disinfection and is potentially in the discharge. In accordance with current DEQ guidance, staff used a default data point of 0.2 mg/L and the calculated WLAs to derive limits. A monthly average of 0.008 mg/L and a weekly average limit of 0.010 mg/L were calculated during the last reissuance and are proposed to be carried forward with this reissuance (Attachment 7).

UOSA requested that the weekly average for Total Residual Chlorine (TRC) be calculated using the 2.5 multiplier used for the conventional and nutrient limitations. DEQ utilizes a statistical program to determine the monthly average and weekly averages for toxic parameters. The statistics take into account the frequency of monitoring along with the calculated wasteload allocations and an estimated effluent concentration to determine whether reasonable potential exists for the effluent concentration to exceed the calculated WLAs. From this evaluation, the program establishes limitations that will protect the receiving stream. This statistical package has been in use for many years and staff believes that it is appropriate for TRC in this permit as well.

2) Metals/Organics:

Effluent data from the permit application was reviewed and no limits or further monitoring are needed.

d) Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

The Occoquan Policy (9VAC25-410), was established to regulate jurisdictional domestic sewage and set forth requirements for high performance regional treatment plants, to protect the Occoquan watershed from

point source pollution. The policy establishes effluent quality requirements, as well as administrative and technical requirements for regional sewage treatment plants like UOSA.

9VAC25-410-20 of the regulation establishes the minimum effluent quality requirements for any regional sewage treatment plant in the Occoquan Watershed. Those final effluent limits are as follows:

Parameter	Monthly Average
Chemical Oxygen Demand	10.0 mg/L
Total Suspended Solids	1.0 mg/L
Total Phosphorus	0.1 mg/L
Turbidity*	0.5 NTU
MBAS (Surfactants)	0.1 mg/L
Total Kjeldahl Nitrogen	1.0 mg/L
Fecal Coliform	<2 n/cmL
Total Nitrogen**	1.0 mg/L

The * for turbidity refers to 9VAC25-410-20 where turbidity shall be measured immediately prior to chlorination.

The ** for nitrogen refers to 9VAC25-410-20E.2, which states "The operation of nitrogen removal facilities is required when the ambient nitrate concentration (as N) is 5.0 mg/L or higher in the Occoquan reservoir in the vicinity of the Fairfax Water Authority intake point. The owner of the regional authority is responsible for knowing ambient results of nitrate and when operation of the nitrogen removal facilities is necessary."

The Dissolved Oxygen (DO) limit is set to meet the water quality criteria for DO in the receiving stream. The pH limitations are also set at the water quality criteria.

Conventional Pollutants and the expansion to 64 MGD: The regulatory requirements of 9VAC25-410 are concentration based and are not subject to change as the flows increase. Because the limits are so stringent, there is no need to model DO depletion or for ammonia toxicity. During the 2005 permit modification, only the mass loading limits were modified to reflect the new design flow of 64 MGD.

As part of the 2007 reissuance, staff replaced Fecal Coliform monitoring with *E. coli* monitoring and a monthly average of <2 n/cmL (geometric mean). It was staff's best professional judgment that *E. coli* limitations are appropriate since the Virginia Water Quality Standards were amended in January 2003 to replace Fecal Coliform with *E. coli* as the indicator organism, and this meets the intention of the Occoquan Policy. This decision shall be carried forward with this reissuance.

e) Effluent Limitations and Monitoring, Outfall 001 – Nutrients

VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries. Only concentration limits are now found in the individual VPDES permit when the facility installs nutrient removal technology. The basis for the concentration limits is 9VAC25-40 - *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed* which requires new or expanding discharges with design flows of ≥0.04 MGD to treat for TN and TP to either BNR levels (TN = 8 mg/L; TP = 1.0 mg/L) or SOA levels (TN = 3.0 mg/L and TP = 0.3 mg/L).

This regulation allows exceptions to the SOA effluent limits in cases where local water quality could be harmed. UOSA submitted documentation in August 2005 to demonstrate that the Occoquan Reservoir benefits from the nitrates in the UOSA discharge that mitigate the release of phosphorus from the reservoir sediments, and requested that DEQ consider not imposing a total nitrogen concentration limit. The documentation, developed by the Occoquan Watershed Monitoring Laboratory of Virginia Tech, stated that

the nitrates prevent anaerobic conditions from occurring in the sediments and thus prevent or delay the release of ammonia and phosphorus into the water column. By controlling these substances, the reservoir has fewer algal blooms and improved water quality. DEQ concurs with these findings, so DEQ has placed a special condition in this permit that requires the permittee to design the 64 MGD facilities to meet a Total Nitrogen Annual Average concentration of 6.75 mg/L so that the facility can comply with their Total Nitrogen annual load at the higher flows.

This facility has also obtained coverage under 9VAC25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia.* This regulation specifies and controls the nitrogen and phosphorus loadings from facilities and specifies facilities that must register under the general permit. Nutrient loadings for those facilities registered under the general permit as well as compliance schedules and other permit requirements, shall be authorized, monitored, limited, and otherwise regulated under the general permit and not this individual permit. This facility has coverage under this General Permit; the permit number is VAN010019. Total Nitrogen Annual Loads and Total Phosphorus Annual Loads from this facility are found in 9VAC25-720 – *Water Quality Management Plan Regulation* which sets forth TN and TP maximum wasteload allocations for facilities designated as significant discharges, i.e., those with design flows of $\geq$0.5 MGD above the fall line and $\geq$0.1 MGD below the fall line. UOSA's allocation is based on a flow of 54 MGD and TN and TP concentrations of 8.0 mg/L and 0.10 mg/L respectively.

For the 54 MGD flow tier, the only nutrient reporting required in this individual permit is for Total Phosphorus and Total Kjeldahl Nitrogen. The monthly average concentrations for TP and TKN are required by the Occoquan Policy to protect local water quality. Monitoring for Total Nitrogen and reporting of Total Nitrogen and Total Phosphorus loadings shall be governed by the Watershed General Permit.

Although 9VAC25-31-230F requires that applicable pollutants be expressed in terms of mass, it is staff's best professional judgment that no loadings are necessary in the individual permit since the Total Phosphorus annual load for UOSA is dictated by 9VAC25-720 and regulated by 9VAC25-820 General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation. The TKN load is also regulated by 9VAC25-820 since it is used to calculate the Total Nitrogen Annual Load.

For the 64 MGD flow, no concentration limit for the TN annual average is included. At the 64 MGD flow, it is understood that the facility would have to achieve an annual average of 6.75 mg/L to comply with the annual maximum loading limit prescribed in 9VAC25-720 and with the intentions of the nutrient tech regulation, 9VAC25-40. However, the Virginia Tech Occoquan Watershed Monitoring Laboratory (OWML) has recommended, for the protection of the reservoir as a public water supply, DEQ not place concentration limits in the permit until further study is conducted to determine if this low of a concentration limit could adversely release phosphorus from the reservoir sediments. Staff acknowledges that there is uncertainty about what concentration is necessary to protect the Occoquan Reservoir and accepts the recommendation of the OWML. Staff does not believe there is any consequence to not placing a limit in the permit since UOSA must still abide by the loading limits set forth in its general permit. In lieu of a concentration limit a special condition shall require UOSA to design the 64 MGD facility to meet the annual average concentration of 6.75 mg/L. This approach is in accordance with 9VAC25-40-70.A4. Loading limits are governed by the general permit mentioned above. Monitoring frequencies for Total Nitrogen are in accordance with the frequencies set forth in the General Watershed Permit.

For the 64 MGD flow, no annual average concentration limit for Total Phosphorus is necessary. The Occoquan Policy requires a monthly average concentration of 0.1 mg/L. This is more stringent than the annual limit required by 9VAC25-40-70A(4). Compliance with the monthly average concentration does not guarantee compliance with the annual maximum loading in 9VAC25-720. In order to comply with the loading in 9VAC25-720 at the 64 MGD flow tier, UOSA will have to achieve an annual Total Phosphorus concentration of 0.084 mg/L or provide offsets as allowed by the general permit. Loading limits are governed by the general permit mentioned above.

f) Effluent Limitations and Monitoring Summary.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/l), with the flow values (in MGD) and a conversion factor of 3.785.

Sample Type is in accordance with the recommendations in the VPDES Permit Manual except as explained below.

As part of the last reissuance, staff reduced the frequency of analysis for MBAS (Surfactants) from daily to monthly at the 54 MGD flow tier. Review of the effluent data indicated that the majority of the daily analyses were well below the effluent limitation and that there is no reasonable potential for any water quality impacts. Staff reviewed the data from the current permit term and noted that the monthly analyses were well below the effluent limitations; therefore, the monthly monitoring shall be carried forward with this reissuance as well as at the 64 MGD tier.

During the last reissuance, staff established weekly average limitations in the permit; prior reissuances only included monthly averages. The 1990 amendments to the Occoquan Policy included changing the minimum effluent limitations required by UOSA from weekly average limitations to monthly average limitations. The VPDES Permit Regulation at 9VAC25-31-230D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs. It is staff's best professional judgment that the requirements of the Occoquan Policy do not supersede the requirements of the Permit Regulation; therefore, weekly average limitations were established for COD, Total Phosphorus, Total Kjeldahl Nitrogen, and Total Suspended Solids. A factor of 2.5 is used to calculate the weekly maximum averages rather than the usual 1.5 factor typically used for STPs. The reason is because the limits for UOSA are more stringent than nearly all other STPs. This decision shall be carried forward with this reissuance.

With the reissuance package, UOSA staff requested a reduction in the frequency of analysis at the current flow tier of 54 MGD. The VPDES Permit Manual allows for monitoring reductions for reissuances based on long-term facility performance. While the facility does qualify for frequency reductions, staff must consider that the facility discharges into the raw water supply for Fairfax Water's Griffith Water Treatment Plant. It is also difficult to perform statistical analyses on some of the effluent values since the effluent limitations are at the limit of detection for some of the parameters (TSS, COD). It is staff's best professional judgment that the facility be granted frequency reductions from 1/day to 5 days/week for COD, TSS, TKN, and Total Phosphorus. This decision is based on the exemplary performance at this facility. It is staff's judgment that a reduction in the frequency of analysis shall not compromise the water quality of the Occoquan Reservoir. Staff has placed a special condition in the permit (Fact Sheet Section 21) that shall require the monitoring frequency to increase back to 1/day if the facility receives a Notice of Violation for one of the listed parameters.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19.a. Effluent Limitations/Monitoring Requirements:

Design flow is 54 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the issuance of the CTO for the 64 MGD flow tier or the expiration date, whichever comes first.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
COD	5	10 mg/L 2000 kg/d	25 mg/L 5100 kg/d	NA	NA	5D/W	24H-C
Total Suspended Solids (TSS)	5	1.0 mg/L 200 kg/d	2.5 mg/L 510 kg/d	NA	NA	5D/W	24H-C
Dissolved Oxygen	3	NA	NA	5.0 mg/L	NA	1/D	Grab
Total Kjeldahl Nitrogen (TKN)	5	1.0 mg/L	2.5 mg/L	NA	NA	5D/W	24H-C
MBAS	5	0.10 mg/L	0.25 mg/L	NA	NA	1/M	24H-C
Turbidity	5	0.50 NTU	NA	NA	NA	1/D	3G/24H
E. coli (Geometric Mean)	3, 5	<2 n/100mls	NA	NA	NA	1/D	Grab
Total Residual Chlorine (after dechlorination)	3	0.008 mg/L	0.010 mg/L	NA	NA	1/D	Grab
Total Phosphorus	5	0.10 mg/L	0.25 mg/L	NA	NA	5D/W	24H-C
Chronic Toxicity – *C. dubia* (TU_c)		NA	NA	NA	NL	1/YR	24H-C
Chronic Toxicity – *P. promelas* (TU_c)		NA	NA	NA	NL	1/YR	24H-C

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. 9VAC25-410 Occoquan Policy
6. 9VAC25-40 Nutrient Regulation

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
TIRE = Totalizing, indicating and recording equipment.
NTU = Nephelometric Turbidity Units

1/D = Once every day.
1/M = Once every month.
5D/W = Five times every week.
1/YR = Once every year.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the Monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by ≥10% or more during the monitored discharge.

3G/24H = Twenty-four Hour Composite – Consisting of three (3) grab samples collected at 8-hour intervals.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

19.b. Effluent Limitations/Monitoring Requirements:

Design flow is 64 MGD.

Effective Dates: During the period beginning with the CTO for the 64 MGD flow and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
COD	5	10 mg/L 2400 kg/d	25 mg/L 6100 kg/d	NA	NA	1/D	24H-C
Total Suspended Solids (TSS)	5	1.0 mg/L 240 kg/d	2.5 mg/L 610 kg/d	NA	NA	1/D	24H-C
Dissolved Oxygen	3	NA	NA	5.0 mg/L	NA	1/D	Grab
Total Kjeldahl Nitrogen (TKN)	5	1.0 mg/L	2.5 mg/L	NA	NA	1/D	24H-C
MBAS	5	0.10 mg/L	0.25 mg/L	NA	NA	1/M	24H-C
Turbidity	5	0.50 NTU	NA	NA	NA	1/D	3G/24H
E. coli (Geometric Mean)	3, 5	<2 n/100mls	NA	NA	NA	1/D	Grab
Total Residual Chlorine (after dechlorination)	3	0.008 mg/L	0.010 mg/L	NA	NA	1/D	Grab
Nitrate+Nitrite, as N	3, 6	NL mg/L	NA	NA	NA	3D/W	24H-C
Total Nitrogen [a.]	3, 6	NL mg/L	NA	NA	NA	3D/W	Calculated
Total Nitrogen – Year to Date	3, 6	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen - Calendar Year [b.]	3, 6	NL mg/L	NA	NA	NA	1/YR	Calculated
Total Phosphorus	5	0.10 mg/L	0.25 mg/L	NA	NA	1/D	24H-C
Chronic Toxicity – *C. dubia* (TU_c)		NA	NA	NA	NL	1/Q	24H-C
Chronic Toxicity – *P. promelas* (TU_c)		NA	NA	NA	NL	1/Q	24H-C

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgment
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. 9VAC25-410 Occoquan Policy
6. 9VAC25-40 Nutrient Regulation

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
TIRE = Totalizing, indicating and recording equipment.
NTU = Nephelometric Turbidity Units

1/D = Once every day.
1/M = Once every month.
3D/W = Three days every week.
1/Q = Once every quarter.
1/YR = Once every calendar year.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the Monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by ≥10% or more during the monitored discharge.

3G/24H = Twenty-four Hour Composite – Consisting of three (3) grab samples collected at 8-hour intervals.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

a. Total Nitrogen = Sum of TKN plus Nitrate+Nitrite

b. The permittee shall design the 64 MGD facility to meet an Annual Average of 6.75 mg/L for Total Nitrogen.

20. Other Permit Requirements :

a) Part I.B. of the permit contains additional chlorine monitoring requirements, quantification levels and compliance reporting instructions.
Typically, a minimum chlorine residual of 1.0 mg/L must be maintained at the exit of the chlorine contact tank to assure adequate disinfection, and no more that 10% of the monthly test results for TRC at the exit of the chlorine contact tank shall be <1.0 mg/L with any TRC <0.6 mg/L considered a system failure. Monitoring at numerous STPs has concluded that a TRC residual of 1.0 mg/L is an adequate indicator of compliance with the *E. coli* criteria. *E. coli* limits are defined in this section as well as monitoring requirements to take effect should an alternate means of disinfection be used. Variance from these requirements are allowed where the discharger provides adequate indicator microorganism test results for the effluent that verify disinfection standards were met during the TRC violations. The permit also requires daily bacteria monitoring. In the current permit, UOSA was allowed a minimum chlorine contact value of 0.6 mg/L with no excursions since the bacteria values have demonstrated that disinfection standards were met. With the 2007 reissuance, staff removed the chlorine contact monitoring since the facility has consistently demonstrated that the bacteria values are less than detection. Staff proposes to carry forward this decision with this reissuance.

9VAC25-31-190.L.4.c requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

The calculations for the Nitrogen and Phosphorus parameters shall be in accordance with the calculations set forth in 9VAC25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia.* §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9VAC25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, these reporting calculations are intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

b) Permit Section Part I.C., details the requirements for the Whole Effluent Toxicity (WET) Program.

The VPDES Permit Regulation at 9 VAC 25-31-210 requires monitoring and 9VAC25-31-220.I, requires limitations in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. A WET program is imposed for municipal facilities with a design rate >1.0 MGD, with an approved pretreatment program or required to develop a pretreatment program, or those determined by the Board based on effluent variability, compliance history, IWC, and receiving stream characteristics.

Attachment 8 contains a summary of the past toxicity tests and data review of the tests. All monitoring has passed the decision criteria. Annual chronic toxicity testing with two species is proposed for the 54 MGD flow tier. Within six (6) months after the issuance of the CTO for the 64 MGD design flow, the permittee shall initiate quarterly monitoring. The permittee shall collect a total of eight (8) quarterly samples; thereafter, annual monitoring shall commence unless quarterly tests indicate possible toxicity. Testing requirements and reporting are found in this section of the permit.

c) Permit Section Part I.D., details the requirements of a Pretreatment Program.
The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.D requires all discharges to protect water quality. The VPDES Permit Regulation at 9VAC25-31-730 through 900., and the Federal Pretreatment Regulation at 40 CFR Part 403 requires POTWs with a design flow of >5.0 MGD and receiving from Industrial Users (IUs) pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards to develop a pretreatment program.

The pretreatment program for this permittee was approved on September 13, 1985 with subsequent modifications effective on the following dates: January 5, 1994 (incorporating technically based local limits, a permit boilerplate, and an Enforcement Response Plan); August 5, 1994 and September 26, 1995 (incorporating updated legal authorities for regulating contributing dischargers located in Fairfax County, the City of Manassas, and Prince William County); and January 13, 1999 (incorporating updated local limits). UOSA currently has two Categorical Industrial Users: BAE Systems Manassas and Micron Technology.

Program requirements and reporting are found in this section of the permit.

d) Permit Section Part I.E. details requirements of the Sewage Sludge Management Plan, Sludge Monitoring and Additional Reporting Requirements.

1. Regulations:

The VPDES Permit Regulation (9VAC25-31-10 et seq.), has incorporated technical standards for the use or disposal of sewage sludge, specifically land application and surface disposal, promulgated under 40 CFR Part 503.

The Permit Regulation (9VAC25-31-420) also establishes the standards for the use or disposal of sewage sludge. This part establishes standards that consist of general requirements, pollutant limits, management practices, and operational standards for the final use or disposal of sewage sludge generated during the treatment of domestic sewage in the treatment works.

2. Evaluations:

Sludge Classification:

The UOSA is considered as Class I sludge management facility. The permit regulation (9VAC25-31-500) defines a Class I sludge management facility as any POTW which is required to have an approved pretreatment program defined under Part VII of the VPDES Permit Regulation (9VAC25-31-730 to 900) and/or any treatment works treating domestic sewage sludge that has been classified as a Class I facility by the Board because of the potential for its sewage sludge use or disposal practice to adversely affect public health and the environment.

Sludge Pollutant Concentration:

The average pollutant concentrations from sewage sludge analyses provided as part of the UOSA application for the permit reissuance are presented in Table 3a and 3b.

Table 3a – UOSA Results Class A (Pelletizer)

The analysis results are from samples collected every two months during the period from November 2007 through November 2011, except Chromium (4 samples once per month August 2011 through November 2011).

Pollutant	Average Concentration (mg/kg dry weight)	Sample Type
Arsenic	3.1	Composite
Cadmium	1.0	Composite
Chromium	26.0	Composite
Copper	434.2	Composite
Lead	13.9	Composite
Mercury	0.9	Composite
Molybdenum	7.7	Composite
Nickel	19.9	Composite
Selenium	6.2	Composite
Zinc	642	Composite

Table 3b – UOSA Results Class B (Lime Stabilized for Land Application)
The analysis results are from samples collected every two months during the period from November 2007 through November 2011.

Pollutant	Average Concentration (mg/kg dry weight)	Sample Type
Arsenic	3.6	Composite
Cadmium	1.5	Composite
Chromium	21.5	Composite
Copper	323.7	Composite
Lead	9.8	Composite
Mercury	0.7	Composite
Molybdenum	6.1	Composite
Nickel	15.7	Composite
Selenium	4.4	Composite
Zinc	485.4	composite

All sewage sludge applied to the land must meet the ceiling concentration for pollutants, listed in Table 4. Sewage sludge applied to the land must also meet either pollutant concentration limits, cumulative pollutant loading rate limits, or annual pollutant loading rate limits, also listed in Table 4.

Cumulative pollutant loading limits or annual pollutant loading limits may be applied to sewage sludge exceeding pollutant concentration limits but meeting the ceiling concentrations, depending upon the levels of treatment achieved and the form (bulk or bag) of sludge applied. It should be noted that ceiling concentration limits are instantaneous values and pollutant concentration limits are monthly average values. Calculations of cumulative pollutant loading should be based on the monthly average values and the annual whole sludge application rate.

Table 4- SEWAGE SLUDGE POLLUTANT LIMITS

Pollutant	Ceiling Concentration Limits for All Sewage Sludge Applied to Land (mg/kg)*	Pollutant Concentration Limits for EQ and PC Sewage Sludge (mg/kg)*	Cumulative Pollutant Loading Rate Limits for CPLR Sewage Sludge (kg/hectare)	Annual Pollutant Rate Limits for APLR Sewage Sludge (kg/hectare/356 day period)**
Arsenic	75	41	41	2.0
Cadmium	85	39	39	1.9
Copper	4,300	1,500	1,500	75
Lead	840	300	300	15
Mercury	57	17	17	0.85
Molybdenum	75	---	---	---
Nickel	420	420	420	21
Selenium	100	100	100	5.0
Zinc	7,500	2,800	2,800	140
Applies to:	All sewage sludge that is land applied	Bulk sewage sludge and bagged sewage sludge	Bulk sewage sludge	Bagged sewage
From VPDES Permit Reg. Part VI	Table 1, 9 VAC 25-31-540	Table 3, 9 VAC 25-31-540	Table 2, 9 VAC 25-31-540	Table 4, 9 VAC 25-31-540

*Dry-weight basis
**Bagged sewage sludge is sold or given away in a bag or other container.

Comparing data from Tables 3a and 3b with Table 4 shows that metal concentrations are significantly below the ceiling, EQ, and PC concentration requirements.

3. Options for Meeting Land Application:

There are four options for meeting land application requirements. The options include the Exceptional Quality (EQ) option, the Pollutant Concentration (PC) option, the Cumulative Pollutant Loading Rate (CPLR) option, and the Annual Pollutant Loading Rate (APLR) option.

Pollutant Concentration (PC) is the type of sludge that may only be applied in bulk and is subject to general requirements and management practices; however, tracking of pollutant loadings to the land is not required. UOSA can produce either a Class A pelletized Exceptional Quality (EQ) sludge or a Class B lime stabilized Pollutant Concentration (PC) sewage sludge for the following reasons:

a) The bulk sewage sludge from the UOSA meets the PC limits in Table 1 of VPDES Permit Regulation Part VI, 9VAC25-31-540.

b) The VPDES Permit Regulation, Part VI, Subpart D, (9VAC25-31-690 through 720) establishes the requirements for pathogen reduction in sewage sludge.

UOSA produces a Class A sludge in accordance with 9VAC25-31-710A.7. – Class A Alternative 7. Alternative 7 defines Class A sludge as "Sewage sludge that is used or disposed shall be treated in one of the Processes to Further Reduce Pathogens." UOSA utilizes 9VAC25-31-710E.2. Heat Drying. Class A Biosolids are produced by centrifuging blended sludge to a nominally 25 percent solids content. The wet cake then passes into a Swiss Combi/Berlie rotary drum dryer pelletizer to produce Class A Exceptional Quality biosolids. The pathogen reduction requirements met are found in 9VAC25-31-710.A.7, *Alternative 5 (fecal coliform density is less than 1000 MPN per gram of dry solids and Process to Further Reduce Pathogens Option 2, Heat Drying*) and the vector attraction reduction requirement met is found in 9VAC25-31-720.B.8 (*percent solids containing un-stabilized solids shall be equal to or greater than 90 percent*).

UOSA also produces a Class B sludge in accordance with the regulation 9VAC25-31-710.B.2. - Class B - Alternative 2. Alternative 2 defines Class B sludge as "Sewage sludge that is used or disposed that has been treated in a process that is equivalent to a Process to Significantly Reduce Pathogens (PSRP), as described in (9VAC25-31-710.D.). UOSA treats sludge using an anaerobic digestion process to reduce pathogens in accordance with the requirements of 9VAC25-31-710D.3 and also using lime stabilization in accordance with the requirements of 9VAC25-31-710D.5.

Class B Biosolids are produced by lime stabilizing centrifuged solids as prescribed in the Federal and State Biosolids regulations. The pathogen reduction requirements met are found in 9VAC25-31-710.B.3, Alternative 2 (*Process to Significantly Reduce Pathogens, Option 5, Lime Stabilization*) and the vector attraction reduction requirements are found in 9VAC25-31-720.B.6 (*the pH of the sludge shall be raised and retained at 12 for 2 hours and then to 11.5 or higher for an additional 22 hours*).

Class B Biosolids are produced by dewatering anaerobically digested solids utilizing recessed chamber filter presses. The pathogen reduction requirements met are found in 9VAC25-31-710.B.2, Alternative 1 (*fecal coliform geometric mean of seven samples is less than 2 million MPN per gram of dry solids*) and the vector attraction reduction requirement is found in 9VAC25-31-720.B.1 (*the mass of volatile solids shall be reduced to a minimum of 38%*).

c) The VPDES Permit Regulation, Part VI, Subpart D, (9VAC25-31-690 through 720) also establishes the requirements for Vector Attraction Reduction in sewage sludge. Based on the information supplied with the VPDES Sludge Application, the UOSA meets the requirements for Vector Attraction Reduction as defined by 9VAC25-31-720B.1.: the mass of volatile solids in the sewage sludge is reduced by a minimum of 38 percent, calculated according to the method in 9VAC25-31-490.B.8., by 9VAC25-31-720B.6.: the pH of sewage sludge is raised to 12 or higher by alkaline addition, or by 9VAC25-31-720B.8.: 90 percent solids of sewage sludge with unstabilized solids.

4) Parameters to be Monitored:

In order to assure the sludge quality, the following parameters require monitoring: Arsenic, Cadmium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, and Zinc.

In order to ensure that proper nutrient management and pH management practices are employed, the following parameters are required: pH, Total Kjeldahl Nitrogen, Ammonia Nitrogen, Nitrate Nitrogen, Total Phosphorus, Total Potassium, and Alkalinity (lime treated sludge should be analyzed for percent calcium carbonate equivalence). The nutrient and pH monitoring requirements apply only if the permittee land applies their own sludge. Since UOSA has contracted the land application responsibilities to Synagro Mid-Atlantic of Champlain, Virginia, they are not required to monitor for nutrients, pH, Total Potassium and Alkalinity.

Soil monitoring in conjunction with soil productivity information is critical, especially for frequent applications, to making sound sludge application decisions from both an environmental and an agronomic standpoint. Since UOSA has contracted the land application responsibilities to Synagro Mid-Atlantic, of Champlain, Virginia, they are not required to perform soil monitoring.

5) Monitoring Frequency:

The monitoring frequency is based on the amount of sewage sludge applied in a given 365-day period. The permit application indicates that the total dry metric tons of sewage sludge generated at UOSA are 4,525 dry metric tons (3,276 dry metric tons Class A and 1,249 dry metric tons Class B) per 365-day period. In the regulation, the monitoring frequency for facilities that produce equal to or greater than 1,500 but less than 15,000 metric tons per 365-day period is once per 60 days. This reissuance proposes a monitoring frequency of 1/2M.

UOSA is required to provide the results of all monitoring performed in accordance with Part I.A., and information on management practices and appropriate certifications no later than February 19th of each year (as required by the 503 regulations) to the Northern Regional Office of the Department of Environmental Quality. Each report must document the previous calendar year's activities.

6) Sampling:

Representative sampling is an important aspect of monitoring. Because the pollutant limits pertain to the quality of the final sewage sludge applied to the land, samples must be collected after the last treatment process prior to land application. Composite samples shall be required for all samplings from this facility.

7) Sludge Management Plan (SMP):

The SMP is required to be part of the VPDES permit application. The VPDES Sewage Sludge Permit Application Form and its attachments will constitute the applicant's SMP. Any proposed sewage treatment works treating domestic sewage must submit a SMP with the appropriate VPDES permit application forms at least 180 days prior to the date proposed for commencing operations. The permittee shall conduct all sewage sludge use or disposal activities in accordance with the SMP approved with the issuance of this permit. Any proposed changes in the sewage sludge use or disposal practices or procedures followed by the permittee shall be documented and submitted for Virginia Department of Environmental review and approval no less than 90 days prior to the effective date of the changes.

Upon approval, the SMP becomes an enforceable part of the permit. The permit may be modified or alternatively revoked and reissued to incorporate limitations/conditions necessitated by substantial changes in sewage sludge use or disposal practices.

UOSA has submitted the VPDES Sewage Sludge Permit Application Form and its attachments. Their SMP dated March 14, 2012, is on file at the Northern Regional Office of the Department of Environmental Quality.

8) Reporting Requirements:

The reporting requirements are for POTWs with a design flow rate equal to or greater than 1 MGD (majors), POTWs that serve a population of 10,000 or greater, and Class I sludge management facilities. A permit special condition, which requires these generators to submit an annual report on February 19th of each year, is included. The UOSA shall use the Discharge Monitoring Report (DMR) forms as part of the annual report. A sample form (SP1 and S01) with proper DMR parameter codes and its instructions are provided. In addition to the DMR forms, the generators who land apply sewage sludge are responsible for submitting the additional information required by 9VAC25-31-590, *i.e.*, appropriate certification statements, descriptions of how pathogen and vector attraction reduction requirements are met, descriptions of how the management practices (if applicable) are being met, and descriptions of how site restrictions (if applicable) are being met.

9) Records Keeping:

This special condition outlines record retention requirements for sludge meeting Class B pathogen reduction and vector attraction reduction alternative 1-10. Table 7 presents the record keeping requirements.

Table 5: Record Keeping for PC Sludge

1	Pollutant concentrations of each pollutant in Part I.A.3. of the permit;
2	Description of how the pathogen reduction requirement in Part I.A.3. of the permit are met;
3	Description of how the vector attraction requirements in Part I.A.3. of the permit are met;
4	Description of how the management practice specified in the approved Sludge Management Plan and/or the permit are met;
5	Description of how the site restriction specified in the Sludge Management Plan and/or the permit are met;
6	Certification statement in Part I.E.3.b.2.f. of the permit.

21. Other Special Conditions:

a) 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.2 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.

b) Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-280 B.9 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c) O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d) CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

e) Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200 D, and Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class I operator.

f) Reliability Class. The Sewage Collection and Treatment Regulation at 9VAC25-790 requires sewerage works achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. The facility is required to meet a reliability Class of I.

g) Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220 D requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

h) Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-200.C.4 requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works. This special condition is found in Section E of the VPDES permit.

i) Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2, and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage. This special condition is found in Section E of the VPDES permit.

j) Nutrient Offsets. The Virginia General Assembly, in their 2005 session, enacted a new Article 4.02 (Chesapeake Bay Watershed Nutrient Credit Exchange Program) to the Code of Virginia to address nutrient loads to the Bay. Section 62.1-44.19:15 sets forth the requirements for new and expanded dischargers, which are captured by the requirements of the law, including the requirement that non-point load reductions acquired for the purpose of offsetting nutrient discharges be enforced through the individual VPDES permit.

k) Total Nitrogen Removal Facilities. In accordance with Part 2.E. of the Occoquan Policy (9VAC25-410), the permittee is required to operate nitrogen removal facilities when the ambient nitrate concentration of the Occoquan Reservoir at the Fairfax Water's raw water intake reaches 5.0 mg/L. The permittee is responsible for knowing the ambient results of nitrate and when to operate the nitrogen removal facilities.

l) E3/E4. 9VAC25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

m) Annual Average Total Nitrogen at 64 MGD. In lieu of an annual average total nitrogen limit, the permittee shall be required to design the 64 MGD treatment works to meet an Annual Average concentration of 6.75 mg/L.

n) Nutrient Reopener. 9VAC25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

o) TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may to developed and approved for the receiving stream.

p) PCB Monitoring. This special condition requires the permittee to conduct PCB dry weather and wet weather monitoring using ultra-low level PCB analysis to support the development of the PCB TMDL for the fish consumption use impairment in Bull Run.

q) Effluent Monitoring Reductions for Parameters listed in Part I.A.1. This special condition sets forth the requirements for monitoring reductions for COD, TSS, TKN and Total Phosphorus at the 54 MGD flow tier. Should the facility be issued a Notice of Violation for any of these parameters, the monitoring frequency shall revert back to once per day until permit expiration.

Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

22. Changes to the Permit from the Previously Issued Permit:

a) Special Conditions:
   1) The special condition language for Nutrient Offsets, E3/E4, and the Nutrient Reopener were updated.
   2) The Pretreatment and Toxicity Monitoring language were updated according to current DEQ guidance.
   3) A special condition for low-level PCB monitoring was added based on the Fish Consumption Use Impairment in Bull Run.
   4) A special condition for monitoring reductions for the 54 MGD flow tier was added.

b) Monitoring and Effluent Limitations:
   1) The monitoring frequency at the 54 MGD flow tier for TSS, COD, TKN, and Total Phosphorus was reduced from 1/day to 5 days/week.
   2) The monitoring for Turbidity was changed from three individual grabs to a composite of the three grab samples.

c) Other:
   1) The facility's name was updated to Upper Occoquan Service Authority from Upper Occoquan Sewage Authority.

23. Variances/Alternate Limits or Conditions:

None

24. Public Notice Information:

First Public Notice Date: 11/16/12 Second Public Notice Date: 11/23/12

Public Notice Information is required by 9VAC25-31-280B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3834, Alison.Thompson@deq.virginia.gov. See Attachment 9 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

25. Additional Comments:
Previous Board Action(s): None.

Staff Comments: None.

Public Comment: No comments received.

EPA Checklist: The checklist can be found in Attachment 10.

Flow Frequency Determination

Alison L. Thompson – NRO Water Permit Writer

July 5, 2012

This flow frequency determination was completed as part of the reissuance of the Upper Occoquan Service Authority's VPDES permit VA0024988. It was last confirmed in 2007 with the last permit reissuance. Prior to that, Paul Herman last did the flow determination in July 1996 and confirmed the data in 2001. The values at the discharge point were determined by inspection of the USGS Manassas Quadrangle topographical map which shows the Outfall 001 is from a reservoir which is fed by intermittent streams. The receiving stream below the reservoir is made up entirely by the flow from the discharge from Outfall 001. The flow frequencies at the discharge point are 0.0 cfs for all critical flows. The discharge travels down the stream bed approximately 0.3 miles and enters Bull Run.

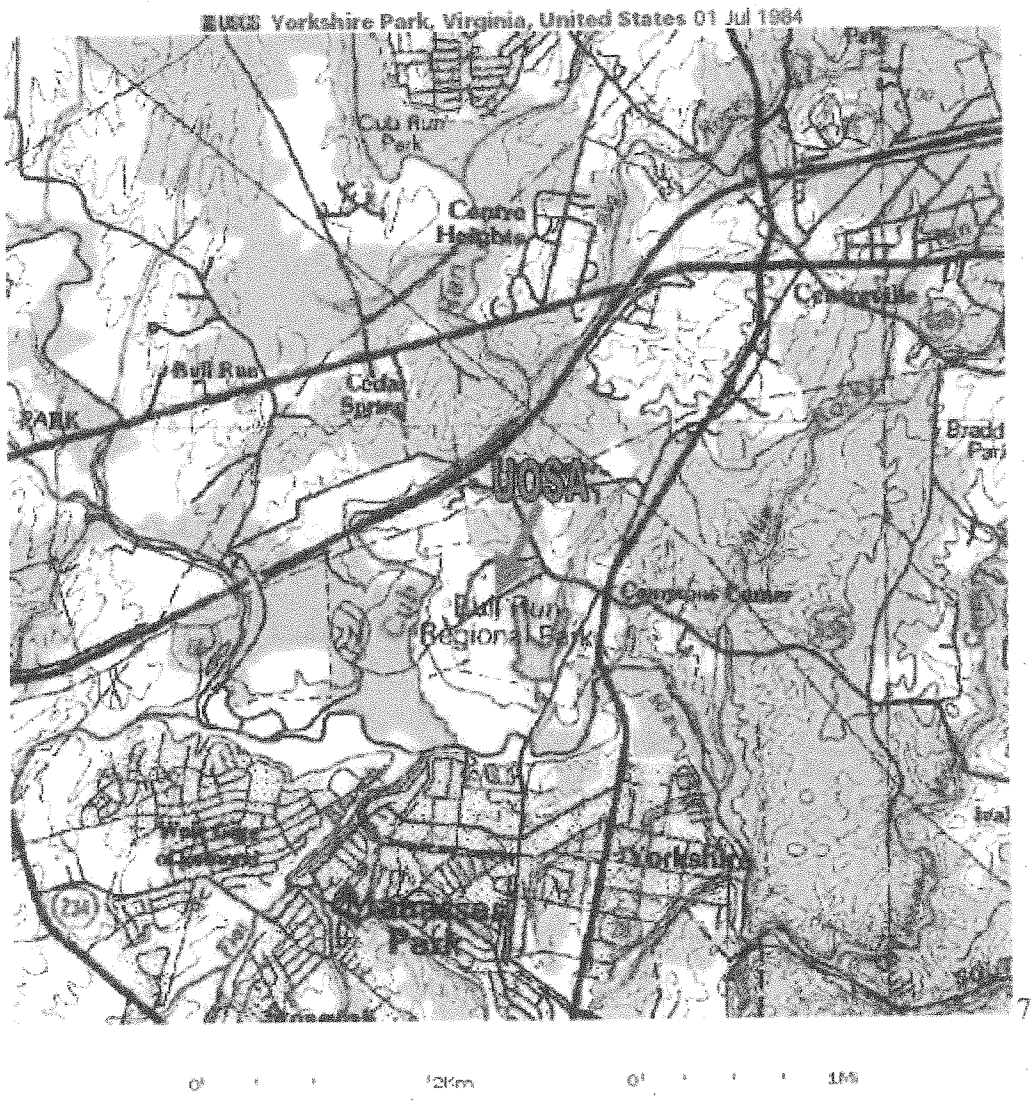
Since this discharge is in the Occoquan watershed, the effluent limitations in the Occoquan Policy are applied at the discharge point. The flow frequencies for Bull Run presented below are calculated for the purpose of modeling toxics. The Bull Run gage was approximately located at the point where the discharge stream enters Bull Run. The gage was active from 1951 through 1981.

Bull Run near Manassas, VA (#01657000):

Drainage Area = 147 sq. mi.

1Q10 = 0.25 cfs	1Q10 = 0.16 mgd
7Q10 = 0.43 cfs	7Q10 = 0.28 mgd
30Q5 = 1.5 cfs	30Q5 = 0.97 mgd
30Q10 = 0.84 cfs	30Q10 = 0.54 mgd
1Q30 = 0.12 cfs	1Q30 = 0.08 mgd
High Flow 7Q10 = 4.3 cfs	High Flow 7Q10 = 2.8 mgd
High Flow 1Q10 = 3.3 cfs	High Flow 1Q10 = 2.1 mgd
High Flow 30Q10 = 11 cfs	High Flow 30Q10 = 7.1 mgd
Harmonic Mean = 6.8 cfs	Harmonic Mean = 4.4 mgd

High flow months are December through April.



TOPOGRAPHIC MAP ONE-MILE BEYOND FACILITY PROPERTY

UPPER OCCOQUAN SEWAGE AUTHORITY

Chemical Storage

COMMODITY	STORAGE CAPACITY
SODIUM HYPOCHLORITE	
BLDG. CC	16,800 gal's
BLDG. D/2	3,500 gal's
BLDG. U	6,000 gal's
BLDG. JJ	36,000 gal's
SODIUM BISULFITE - BLDG JJ	20,000 gal's
SODIUM HYDROXIDE - BLDG CC	8,400 gal's
BLDG. D/2	3,500 gal's
BLDG. U	6,000 gal's
FERRIC CHLORIDE - BLDG H/1	4,800 gal's
PROPANE (LPG) - BLDG U	33.5 gal cyl
HYDROCHLORIC ACID - BLDG H/1	6,000 gal's
GRANULAR LIME (PEBBLE Cao)	
H/1	240 TONS
H/2	300 TONS
ALUM L/1	16,000 gal's
L/2	11,600 gal's
ANIONIC POLYMER J/2	3 -275 gal totes
CARBON DIOXIDE	
38/1-3 EAST	93 TONS
38/4-7 WEST	200 TONS
CENTRIFUGE **CATIONIC POLYMER**	14,000 gal's
MINERAL OIL DUST SUPPRESSANT - U	7,500 gal's
SULFURIC ACID - U	500 gal's
GROUND LIME - BLDG. U	30 TONS
NITROGEN	1,500 gal
STRAW	50 Bales
SALT	30 BAGS
SODIUM BICARBONATE	250 BAGS
OAKITE	15 - 20 GALLON DRUMS
ANTI FOAM AGENT	1 - 55 GALLON DRUM

COMMENTS: When Homeland Security is above Code - Yellow, the following instructions apply:

HCl deliveries must arrive between 0600-1600. Supplier is to notify UOSA of Driver name prior to delivery. If supplied and actual names do not match, refuse delivery. Per JS 10/22/01

Attachment 3

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

March 1, 2010

Mr. Charles Boepple
Executive Director
Upper Occoquan Sewage Authority
14631 Compton Road
Centreville, VA 20121

Re: UOSA – Waste Water Treatment Plant Inspection, Permit VA0024988

Dear Mr. Boepple:

Enclosed is a copy of the technical inspection report generated from observations made on February 18, 2010 while conducting a Facility Technical Inspection at the UOSA – Waste Water Treatment Plant (WWTP). The compliance staff would like to thank the UOSA staff for their time and assistance during the inspection.

Please note the Requirements Corrective Actions section and recommendations included in the Notes and Comments section. A written progress report is due to this office by **March 21, 2010** for the items addressed in the Required Corrective Actions. Your response may be sent either via the US Postal Service or electronically, via E-mail. DEQ recommends sending electronic responses as an Acrobat PDF or in a Word-compatible, write-protected format. Additional inspections may be conducted to confirm the facility is in compliance with permit requirements.

If you have any questions or comments concerning this report, please feel free to contact me at the Northern Regional Office at (703) 583-3833 or by E-mail at terry.nelson@deq.virginia.gov.

Sincerely,

Terry Nelson

Terry Nelson
Environmental Specialist II

cc: Permit/DMR File
Electronic Copy: Compliance Manager, Compliance Auditor
EPA Copy: Steve Stell – OWCP

DEQ
WASTEWATER FACILITY INSPECTION REPORT
PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0024988	**October 11, 2007**		**October 10, 2012**

Facility Name	Address	Telephone Number
UOSA WWTP	**14631 Compton Road Centerville, VA 20121**	**703-830-2200**
Owner Name	Address	Telephone Number
Upper Occoquan Sewage Authority	**14631 Compton Road Centerville, VA 20121**	**703-830-2200**
Responsible Official	Title	Telephone Number
Mr. Charles Boepple	**Executive Director**	**703-830-2200**
Responsible Operator	Operator Cert. Class/number	Telephone Number
Mr. Jack Sellman	**Class 1/1909 - 000630**	**703-830-2200**

TYPE OF FACILITY:

DOMESTIC				**INDUSTRIAL**			
Federal		Major	**X**	Major		Primary	
Non-federal	**X**	Minor		Minor		Secondary	

INFLUENT CHARACTERISTICS:	DESIGN:
Flow	**54.0 MGD**
Population Served	**273,350**
Connections Served	**Unknown**
COD **(January 2010)**	**469**
TSS **(January 2010)**	**209**

EFFLUENT LIMITS: Units in mg/L unless otherwise specified.

Parameter	Min.	Avg.	Max.	Parameter	Min.	Avg.	Max.
Flow (MGD)		**54.0**	**NL**	**Total Phosphorus**		**0.10**	**0.25**
pH (s.u.)	**6**		**9**	**Total Nitrogen**		**NL**	
MBAS		**0.10**	**0.25**	**TKN**		**1.0**	**2.5**
TSS		**1.0**	**2.5**	**Dissolved Oxygen**	**5.0**		
COD		**10**	**25**	**Cl_2, Inst Res Max**		**0.008**	**0.010**
Turbidity (NTU)		**0.50**		**E. Coli (#/100 mL)**		**<2**	

Receiving Stream	**Bull Run**
Basin	**Potomac River**
Discharge Point (LAT)	**38° 48' 35" N**
Discharge Point (LONG)	**77° 27' 15" W**

Virginia Department of Environmental Quality
Northern Regional Office

FOCUSED CEI TECH/LAB INSPECTION REPORT

FACILITY NAME: UOSA WWTP	**INSPECTION DATE:**	February 18, 2010	
	INSPECTOR	Terry Nelson	
PERMIT No.: VA0024988	**REPORT DATE:**	March 2, 2010	
TYPE OF FACILITY: ☑ Municipal ☑ Major ☐ Industrial ☐ Minor ☐ Federal ☐ Small Minor ☐ HP ☐ LP	**TIME OF INSPECTION:**	Arrival 0715	Departure 1300
	TOTAL TIME SPENT (including prep & travel)	20 hours	
PHOTOGRAPHS: ☑ Yes ☐ No	**UNANNOUNCED INSPECTION?**	☑ Yes ☐ No	
REVIEWED BY / Date: Earl L. Stafford 2/26/10			
PRESENT DURING INSPECTION: Jack Sellman, Ben Caoili, Louie Fortune			

TECHNICAL INSPECTION

1. Has there been any new construction? • If so, were plans and specifications approved? Comments: No major construction, several upgrade projects about to start	☐ Yes ☑ No
2. Is the Operations and Maintenance Manual approved and up-to-date? Comments:	☑ Yes ☐ No
3. Are the Permit and/or Operation and Maintenance Manual specified licensed operator being met? Comments:	☑ Yes ☐ No
4. Are the Permit and/or Operation and Maintenance Manual specified operator staffing requirements being met? Comments:	☑ Yes ☐ No
5. Is there an established and adequate program for training personnel? Comments:	☑ Yes ☐ No
6. Are preventive maintenance task schedules being met? Comments:	☑ Yes ☐ No
7. Does the plant experience any organic or hydraulic overloading? Comments:	☐ Yes ☑ No
8. Have there been any bypassing or overflows since the last inspection? Comments:	☑ Yes ☐ No
9. Is the standby generator (including power transfer switch) operational and exercised regularly? Comments:	☑ Yes ☐ No
10. Is the plant alarm system operational and tested regularly? Comments:	☑ Yes ☐ No

Permit #	VA0024988

TECHNICAL INSPECTION

11. Is sludge disposed of in accordance with the approved sludge management plan? ☑ Yes ☐ No
Comments:

12. Is septage received? ☑ Yes ☐ No
- If so, is septage loading controlled, and are appropriate records maintained? **Septage receiving records are available.**

Comments:

13. Are all plant records (operational logs, equipment maintenance, industrial waste contributors, sampling and testing) available for review and are records adequate? ☑ Yes ☐ No
Comments:

14. Which of the following records does the plant maintain?
☑ Operational logs ☑ Mechanical equipment maintenance
☑ Instrument maintenance & calibration ☑ Industrial Waste Contribution (Municipal
Comments:

15. What does the operational log contain?
☑ Visual observations ☑ Flow Measurement ☑ Laboratory results ☑ Process adjustments
☑ Control calculations ☐ Other (specify)
Comments:

16. What do the mechanical equipment records contain?
☑ As built plans and specs ☑ Manufacturers instructions ☑ Lubrication schedules
☑ Spare parts inventory ☑ Equipment/parts suppliers
☐ Other (specify)
Comments:

17. What do the industrial waste contribution records contain (Municipal only)?
☑ Waste characteristics ☑ Impact on plant ☑ Locations and discharge types
☐ Other (specify)
Comments:

18. Which of the following records are kept at the plant and available to personnel?
☑ Equipment maintenance records ☑ Operational log ☐ Industrial contributor records
☑ Instrumentation records ☑ Sampling and testing
Comments:

19. List records not normally available to plant personnel and their location:
Comments: **All records are available to appropriate staff. Plant performance and operation records have few restrictions. Records like industrial waste characterization can have need-to-know restrictions.**

20. Are the records maintained for the required time period (three or five years)? ☑ Yes ☐ No
Comments:

Permit #	VA0024988

Facility Description:

This 54 MGD facility utilizes conventional treatment followed by chemical and physical advanced wastewater treatment. The wastewater enters the facility and goes through mechanical bar screens, grit removal cyclones and classifiers, and then through primary clarifiers. The primary effluent is then pumped either to the aerobic biological selectors or to the emergency retention ponds. The biological selectors are where primary effluent is mixed with the return sludge. The wastewater then enters the fine bubble diffuser aeration basins. The water is then sent to the secondary clarifiers.

From the secondary clarifiers, the wastewater flows to the chemical advanced wastewater treatment processes. The facility utilizes the high lime process for phosphorus and trace metal removal as well as for virus inactivation. The high lime process involves feeding lime slurry into the wastewater in rapid mix basins, and the lime slurry is removed using chemical clarifiers and two stage recarbonation. Two stage recarbonation (the pH is first lowered to 10 and then to a pH of 7) provides a much higher quality effluent than single stage recarbonation.

After chemical treatment, the wastewater is then processed through the physical advanced wastewater treatment processes. Four ballast ponds are used to maintain a steady flow through the physical advanced wastewater treatment processes. There are two process trains for this portion of the facility. The older portion of the train uses 12 horizontal multimedia pressure filters followed by 32 upflow/downflow carbon contactors. The newer section uses gravity multimedia filters, plus alum, followed by 8 upflow/downflow carbon contactors. The filters following the carbon contactors are currently not in use. The plant has a multi-hearth furnace to regenerate the activated carbon as necessary.

The final process is chlorination using sodium hypochlorite and dechlorination with bisulfite. The effluent flows into the Final Effluent Reservoir before flowing into an unnamed tributary to Bull Run.

The lime solids generated from the chemical treatment processes are pumped to gravity thickeners to concentrate the solids. The concentrated solids are then processed in recessed chamber plate and frame filter presses to dewater the lime sludge. UOSA has an on-site landfill for the lime solids disposal.

The waste activated sludge solids are blended with the primary sludge and the combined solids are strained prior to thickening and anaerobic digestion. Centrifuges are used to dewater the solids; the centrate is returned to the headworks of the facility.

With the 54 MGD expansion, the facility installed a Berlie/Swiss Combi pelletizer system. This system has a rotary drum dryer and can produce 30 tons/day of Class A/EQ pellets. These pellets are bagged for distribution and are land applied. The facility can lime stabilize the solids for land application if the pelletizer system is offline; which produces Class B solids. Synagro Mid-Atlantic is contracted to land apply the biosolids. UOSA also has a permit with Waste Management's King George Facility for disposal of sewage sludge at the landfill during inclement weather.

Additional information is available at the UOSA website: http://www.uosa-construction.org/index.asp.

Permit #	VA0024988

UNIT PROCESS EVALUATION SUMMARY SHEET

UNIT PROCESS	APPLICABLE	PROBLEMS*	COMMENTS
Sewage Pumping	X		
Flow Measurement (Influent)	X		
Screening/Comminution	X		
Grit Removal	X		
Oil/Water Separator			
Flow Equalization	X		Emergency Retention Ponds and Ballast ponds
Ponds/Lagoons			
Imhoff Tank			
Primary Sedimentation	X	1	Checked 1 unit, noticed small clumps and 1 large clump
Trickling Filter			
Septic Tank and Sand Filter			
Rotating Biological Contactor			
Activated Sludge Aeration	X		
Biological Nutrient Removal			
Sequencing Batch Reactor			
Secondary Sedimentation	X	1	Checked 2 units, needed minor cleaning
Sludge Pumping	X	1	RAS pumps had grate covered with vegetation
Flocculation	X		
Tertiary Sedimentation	X	6	Two basins were clear, two were cloudy
Sewage Pumping	X	1	Significant leakage at L2 filter feed pump station
Filtration	X		
pH Adjustment	X	1	1st stage recarbonation controller covered by grease
Micro-Screening			
Activated Carbon Adsorption			
Chlorination	X		
Dechlorination	X		
Ozonation			
Ultraviolet Disinfection			
Post Aeration	X		
Flow Measurement (Effluent)	X		
Land Application (Effluent)			
Plant Outfall	X		
Sludge Pumping	X	1	Building J2 pump drain line clogged Building N2 pipe leaking water
Flotation Thickening (DAF)	X	1	Sludge on floor beneath screening pumps
Gravity Thickening	X	1	Chemical/lime solids, 1 unit nearly full of solids
Aerobic Digestion			
Anaerobic Digestion	X		
Lime Stabilization			
Centrifugation	X		Class B solids
Sludge Press	X		Chemical/lime solids
Vacuum Filtration			
Drying Beds			
Thermal Treatment	X		Class A pellets
Incineration			
Composting			
Land Application (Sludge)			

* Problem Codes

1. Unit Needs Attention
2. Abnormal Influent/Effluent
3. Evidence of Equipment Failure
4. Unapproved Modification or Temporary Repair
5. Evidence of Process Upset
6. Other (explain in comments)

Permit #	VA0024988

INSPECTION OVERVIEW AND CONDITION OF TREATMENT UNITS

- The weather was partly sunny, mid 30's with occasional wind gusts.
- Mr. Jack Sellman is the chief operator and Mr. Owsenek is the day shift manager. The UOSA Board of Directors meeting was scheduled for later today so they were not available for the inspection.
- Mr. Louie Fortune has 30 years experience at the plant and accompanied Mr. Nelson on the inspection.

Wastewater Treatment

- No problems were observed at the head works building.
- The primary sedimentation basins were still surrounded by snow. Mr. Fortune and Mr. Nelson walked around one basin. Minor blockage was observed for several overflow weir notches along with the large blockage shown in photograph 1. The water in all basins looked the same color, with minor floating scum.
- The sludge pumps for the primary sedimentation basins were observed, and no problems were noted. When the plant was inspected in April 2007, 3 of the sludge pumps were diaphragm pumps and 1 pump was a double disk pump. There are now 3 double disk pumps and 1 diaphragm pump.
- The primary effluent lift station (PELS) and RAS lift station use large screw pumps. No problems were observed with the PELS. The RAS pumps appeared to be working well also. However, the grate on the top of the RAS pump station shows significant collection of solids and vegetation, see photograph 2.
- The aeration basins for the activated sludge process appeared to be working properly with no dead spots or uneven aeration. Photograph 3 shows one basin.
- The secondary sedimentation basins appeared to be working properly. Mr. Nelson was able to walk around 2 of the active units.
- The processes following secondary sedimentation use lime to remove phosphorus and metals. This process also inactivates many bacteria.
- No problems were observed with the rapid mix and flocculation process.
- Mr. Nelson was able to see about 25% of each chemical clarifier. Although the overflow weirs appeared to need some cleaning, the effluent was clear.
- The effluent from the chemical clarifiers has a pH above 11 SU and the pH is adjusted down to around 7 SU in 2 steps.
- No problems were observed with the first recarbonation basin, see photograph 4. However, a controller for this basin appeared to have a grease leak, see photograph 5.
- No problems were observed with the second recarbonation basin.
- While checking the sludge pumps for the lime treatment process, a minor pipe drip was observed in building N2. Photograph 6 shows the area of the leak.
- One of the sludge pumps in building J2 may have a blocked drain line that allows the seal water drip pan to overflow onto the floor.
- Following pH adjustment, the water flows to the ballast ponds to provide a uniform flow to the filters.
- Each filter building has a separate pump station to pull water from the ballast ponds.
- Mr. Nelson observed the active pumps for the L2 building. Minor leakage from the vertical pumps is normal, and when the water mixes with goose droppings, algae growth like that in photograph 7 occurs.
- One pump appeared to have a significant leakage rate, see photograph 8.
- The filters appeared to be working properly. Most filters had good water clarity, while several filters had lower water clarity and one filter was backwashing. If the filters backwash in clockwise order, the filters with lower clarity were awaiting backwash. Photograph 9 shows the good water clarity achieved.
- Following these filters are the carbon contactors. Water quality in these units appeared very good. One filter was backwashing. The backwash process is shown in photograph 10.

Permit #	VA0024988

INSPECTION OVERVIEW AND CONDITION OF TREATMENT UNITS

- According to UOSA, the carbon regeneration process uses fluidized carbon, which allows spent carbon slurry to be removed and regenerated carbon slurry to be added to a carbon contactor.
- Photograph 11 shows a carbon contactor where the carbon was being replaced.
- The spent carbon is stored in a hopper. Several times per year, a multiple-hearth furnace is used to regenerate the spent carbon. The regenerated carbon is stored in a different hopper.
- Mr. Nelson was able to observe the multiple-hearth furnace in operation. Photograph 12 shows the last furnace pass and a set of rake arms.
- Following filtration, the water goes through disinfection with sodium hypochlorite. The contact tanks are sealed tanks that can not be safely observed.
- To remove the residual chlorine, sodium bisulfite is added to the effluent.
- Following the bisulfite addition, the effluent flows through a post aeration channel and into the final effluent reservoir.

Outfall Testing and Samples

- Mr. Nelson had requested to observe UOSA staff conducting final effluent testing and Mr. Fortune was able to time the inspection accordingly.
- While driving to the effluent testing building, Mr. Fortune drove past the filters in building L1.
- As they passed the L1 building, Mr. Nelson observed water flowing down the road. Mr. Fortune stopped to investigate the cause.
- According to the contractors working on the filters, the filter shown in photograph 13 was isolated and they were draining the line to the filter.
- After about 5 minutes of non-stop flow, Mr. Fortune contacted appropriate UOSA staff for more information.
- UOSA staff said the flow was being directed to a waste drain that is returned to head works.
- Photograph 14 shows the water flowing into the street towards the drain.
- Appropriate steps were taken to take all filters in building L1 off-line to stop the overflow.
- Mr. Fortune and Mr. Nelson continued to the effluent testing building.
- The effluent testing building has sampling taps for the chlorine contact tank and dechlorination. Chlorine residual samples were collected and tested between 0900 and 0910. UOSA staff was conducting chlorine residual testing at the same time. DEQ and UOSA results were within 0.01 mg/L of each other.
- DEQ measured the effluent pH in-situ at 0914 from the final effluent sampling tap.
- UOSA laboratory staff measure the final effluent pH so Mr. Fortune and Mr. Nelson drove to the laboratory building.
- The pH measured by the UOSA laboratory staff from an effluent grab sample was 0.5 SU higher than the DEQ in-situ measurement.
- While at the laboratory Mr. Nelson used the UOSA composite sample that was delivered to the lab that morning to fill three 250 mL bottles at 0930 hours. Two bottles were acidified to < 2 SU using sulfuric acid. All bottles were labeled and were placed on ice.
- UOSA plant staff measure the effluent DO around 1000 so Mr. Nelson returned to the final outfall to conduct DO measurements. DO was measured in the final effluent channel at 1019 hours. The DEQ value was about 0.25 mg/L lower than the UOSA reading.

Permit #	VA0024988

INSPECTION OVERVIEW AND CONDITION OF TREATMENT UNITS

Solids Processing

- Organic solids from the primary treatment and secondary treatment are blended prior to thickening.
- The first step in thickening is Dissolved Air Flotation (DAF). This building is adjacent to head works. One DAF unit was in operation and appeared to be working properly, see photograph 15. The sludge that is fed to the DAF units is screened using pumps that are upstairs from the DAF units. Screening provides a uniform feed and removes clumps and inappropriate materials. Dried solids were observed on the floor beneath one of the screening pumps, see photograph 16.
- The thickened solids from DAF are sent to the anerobic digesters.
- Digester solids are sent to the centrifuges. The centrifuges appeared to be working correctly. Preliminary work for a fourth centrifuge was noticed. Photograph 17 shows a current centrifuge.

- The centrifuge cake is stored for final processing.
- The preferred final process is thermal treatment to produce Class A/EQ pellets. If the thermal treatment unit is down, the solids are lime stabilized to produce Class B biosolids.
- The thermal treatment unit was in operation. The rotary dryer drum is monitored by computer system and remote camera. Based on the cameras and computer monitoring, the rotary dryer was working properly.
- The sludge from the chemical settling basins is sent to the gravity thickeners. One gravity thickener was off-line, one appeared full of solids with about 6 inches of clear water on top, and the other thickener was cloudy, see photograph 18. The two active thickeners appeared to need cleaning. If a gravity thickener overflows, the solids return to the rapid mix process.
- The settled solids from the gravity thickeners are pumped to the pressure filters. During the inspection; one pressure filter was in operation, another one was idle, and the third unit had been locked-out to prevent operation. Adsorbent material was scattered throughout the area. The operator said the locked-out unit had hydraulic problems and that repair efforts by UOSA staff had not been successful.

Wrap Up

- A summary meeting was held, including a discussion of stormwater sampling.
- UOSA staff in attendance included Mr. Sellman, Mr. Owsenek, Mr. Fortune, Ms. Evelyn Mahieu, and Mr. Matt Brooks.
- The stormwater sampling discussion was to clarify the requirements of permit VAR051723.
- DEQ considers the UOSA facility to be a 24/7 operation, so sampling is not limited to daylight hours; however, worker safety is paramount.
- The stormwater outfalls are scattered throughout the property and some outfalls may not discharge when other outfalls are discharging. Mr. Nelson said that sampling outfalls on different days is fine.
- The discharge requirements have changed from a 0.1 inch storm to any storm that produces a discharge. Since sampling can not occur within 72 hours of a previous storm that produced a discharge, changing the criteria from 0.1 inch to a storm that produces a discharge could create more sampling opportunities.
- Ms. Mahieu said she would send a summary email to Mr. Nelson and Ms. Susan Mackert, the stormwater permit writer.
- An electronic copy of the pictures taken by DEQ was provided to UOSA staff.
- Mr. Nelson discussed the inspection observations with UOSA staff, with some correction or clarification from Mr. Fortune.
- Mr. Nelson thanked the UOSA staff for their time and assistance.

Permit #	VA0024988

EFFLUENT FIELD DATA:

Flow	37.1 MGD	**Dissolved Oxygen**	10.35 mg/L	**TRC (Contact Tank)**	0.91 mg/L
pH	6.92 S.U.	**Temperature**	12.0 °C	**TRC (Final Effluent)**	0.01 mg/L
Was a Sampling Inspection conducted?	☑ Yes (see Sampling Inspection Report) ☐ No				

CONDITION OF OUTFALL AND EFFLUENT CHARACTERISTICS:

1. Type of outfall: ☑ Shore based ☐ Submerged Diffuser? ☐ Yes ☑ No
2. Are the outfall and supporting structures in good condition? ☑ Yes ☐ No
3. Final Effluent (evidence of following problems): ☐ Sludge bar ☐ Grease ☐ Turbid effluent ☐ Visible foam ☐ Unusual color ☐ Oil sheen
4. Is there a visible effluent plume in the receiving stream? ☐ Yes ☐ No
5. Receiving stream: ☐ No observed problems ☐ Indication of problems (explain below)

Comments: The final effluent reservoir was not checked.

REQUIRED CORRECTIVE ACTIONS:

1. VPDES Permit Number VA0024988, Part II, Section Q (Proper Operation and Maintenance) states, "The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit...." During the inspection, one supply pump for the L2 filter building was loosing large quantities of water through a seal. This pump shall be repaired or taken out of service.

NOTES and COMMENTS:

- Cold weather and snow has created safety and access problems with settling basins. This has caused delays in some routine cleaning. Mr. Nelson requests that UOSA staff resolve the access problems and resume the normal cleaning schedule.
- Dried solids were observed near the DAF screening pumps. UOSA staff is reminded to properly rinse the floor where spills occur.
- In several locations, water was observed on the floor due to a leaking pipe, leaking valve, or overflowing drain pain. These leaks should be reported and fixed in a timely manner.

Permit #	VA0024988

LABORATORY INSPECTION

PRESENT DURING INSPECTION:	Ben Caoili, Lou Fortune, Gary Petroschuck

1.	Do lab records include sampling date/time, analysis date/time, sample location, test method, test results, analyst's initials, instrument calibration and maintenance, and Certificate of Analysis? ☑ Sampling Date/Time ☑ Analysis Date/Time ☑ Sample Location ☑ Test Method ☑ Test Results ☑ Analyst's Initials ☑ Instrument Calibration & Maintenance ☐ Chain of Custody ☐ Certificate of Analysis	
2.	Are Discharge Monitoring Reports complete and correct? Month(s) reviewed: January 2010	☑ Yes ☐ No
3.	Are sample location(s) according to permit requirements (after all treatment unless otherwise specified)?	☑ Yes ☐ No
4.	Are sample collection, preservation, and holding times appropriate; and is sampling equipment adequate?	☑ Yes ☐ No
5.	Are grab and composite samples representative of the flow and the nature of the monitored activity?	☑ Yes ☐ No
6.	If analysis is performed at another location, are shipping procedures adequate? List parameters and name & address of contract lab(s): •	☐ Yes ☑ No
7.	Is Laboratory equipment in proper operating range?	☑ Yes ☐ No
8.	Are annual thermometer calibration(s) adequate?	☑ Yes ☐ No
9.	Is the laboratory grade water supply adequate? **Not Applicable**	☐ Yes ☐ No
10.	Are analytical balance(s) adequate? **Not Applicable**	☐ Yes ☐ No
11.	Parameters evaluated during this inspection (attach checklists): **DO and Chlorine**	

ANALYST:	**Ben Caoili**	VPDES NO.	**VA0024988**

Parameter: Dissolved Oxygen
Method: Electrode
Facility Elevation - 200 ft
01/08

Meter: YSI Model 50B

METHOD OF ANALYSIS:

X	18th Edition of Standard Methods-4500-O G
	21st or Online Editions of Standard Methods-4500-O G (01)

	DO is a method defined analyte so modifications are not allowed. [40 CFR Part 136.6]	**Y**	**N**
		In-situ	
1)	If samples are collected, is collection carried out with a minimum of turbulence and air bubble formation and is the sample bottle allowed to overflow several times its volume? [B.3]	**X**	
2)	Are meter and electrode operable and providing consistent readings? [3]	**X**	
3)	Is membrane in good condition without trapped air bubbles? [3.b]	**X**	
4)	Is correct filling solution used in electrode? [Mfr.]	**X**	
5)	Are water droplets shaken off the membrane prior to calibration? [Mfr.]	**X**	
6)	Is meter calibrated before use or at least daily? [Mfr.]	**X**	
7)	Is calibration procedure performed according to manufacturer's instructions? [Mfr.]		
		In-situ	
8)	Is sample stirred during analysis? [Mfr.]	**X**	
9)	Is the sample analysis procedure performed according to manufacturer's instructions? [Mfr.]	**X**	
10)	Is meter stabilized before reading D.O.? [Mfr.]	**X**	
11)	Is electrode stored according to manufacturer's instructions? [Mfr.]	**NA**	
12)	Is a duplicate sample analyzed after every 20 samples if citing 18th or 19th Edition [1020 B.6] or daily if citing 20th or 21st Edition [Part 1020] Note: Not required for in situ samples.	**NA**	
13)	If a duplicate sample is analyzed, is the reported value for that sampling event, the average concentration of the sample and the duplicate? [DEQ]	**NA**	
14)	If a duplicate sample is analyzed, is the relative percent difference (RPD) < 20? [18th ed. Table 1020 I; 21st ed. DEQ]		

COMMENTS:	
PROBLEMS:	**No problems observed.**

ANALYST:	**Gary Petroschuck**	VPDES NO	**VA0024988**

Parameter: Total Residual Chlorine
Method: Amperometric Titration (Direct)
04/01

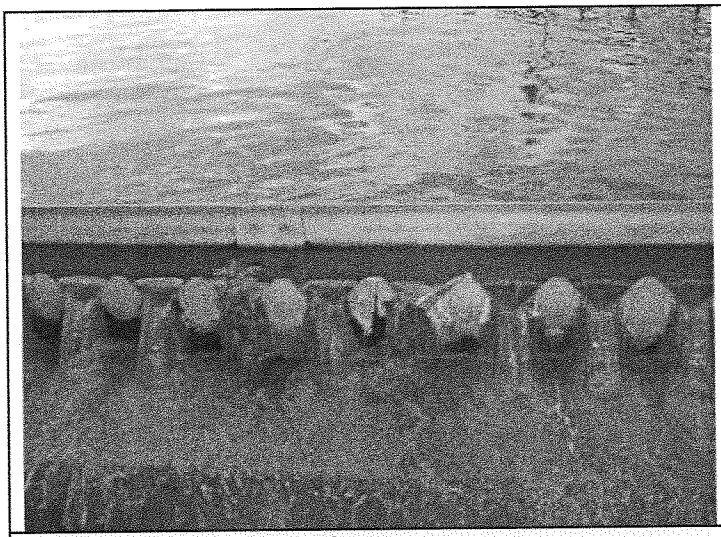
Meter: _____

METHOD OF ANALYSIS:

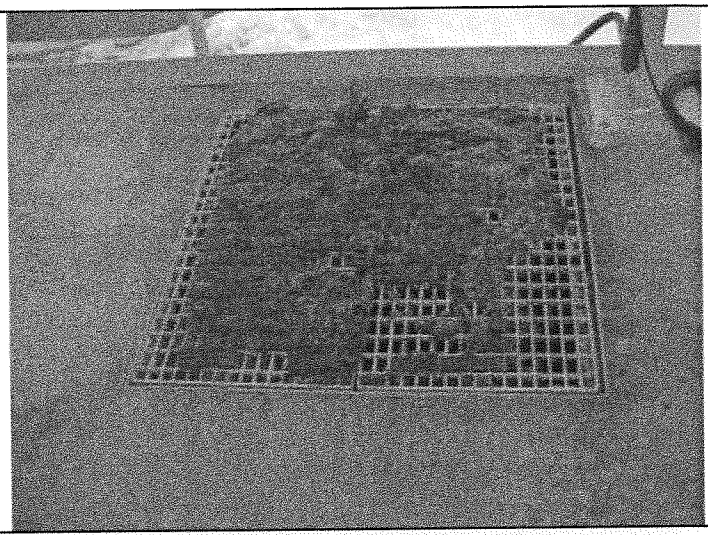
X	18th EDITION OF STANDARD METHODS -4500-CL D
	EPA METHODS FOR CHEMICAL ANALYSIS -330.1
	ASTM D1253 - 86(92)

		Y	N
1)	Is PAO normality 0.00564N? [SM Cl C.3.a;330.1-5.1]	X	
2)	Are reagents free of contamination or growths? [Permit]	X	
3)	Is KI solution discarded when it turns yellow? [SM-3.c; 330.1-5.3]	X	
4)	Is the pH of the acetate buffer solution 4? [SM-3.d; 330.1-5.5]	X	
5)	Are reagents within their indicated shelf lives? [Permit]	X	
6)	Is sample volume 200 mL for chlorine residual up to 2 mg/L; 100 mL or proportionately less diluted up to 200 mL for chlorine residuals in excess of 2 mg/L? [SM-4.a; 330.1-6.1]	X	
7)	Is at least 1 mL KI solution added? [SM-4.c; 330.1-6.3]	X	
8)	Is at least 1 mL acetate buffer added after KI solution? [SM-4.c; 330.1-6.4]	X	
9)	Is titrant added in progressively smaller increments until all needle movement ceases? [SM-4.c; 330.1-6.6]	X	
10)	Is last increment of titrant that causes no needle response subtracted from final volume? [SM-4.c; 330.1-6.6]	X	
11)	Is the sample value calculated correctly? [SM-5; 330.1-7.1] TRC (mg/L) = $\frac{A \times 200}{\text{mL of sample}}$ A = mL PAO used	X	

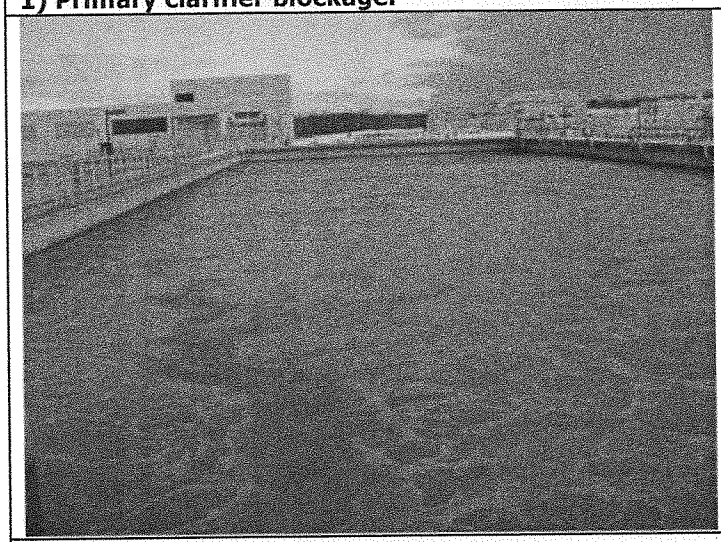
COMMENTS:	**Plant operators conduct this test in the Final Effluent Sampling Building.**
PROBLEMS:	**No problems observed.**



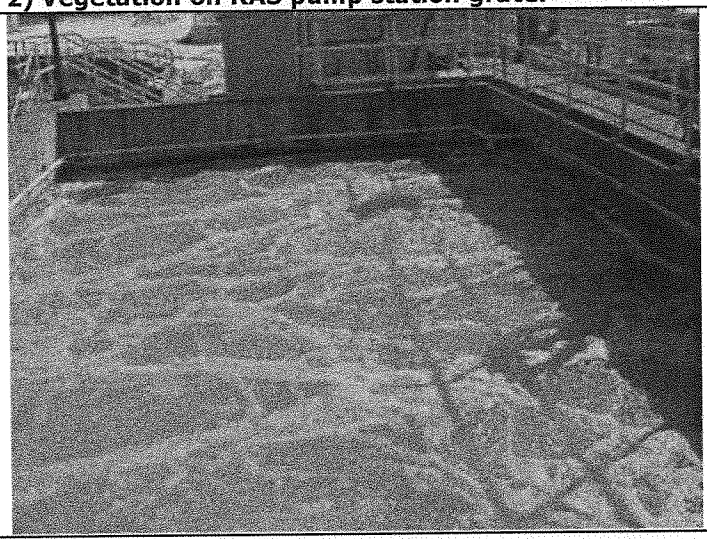
1) Primary clarifier blockage.



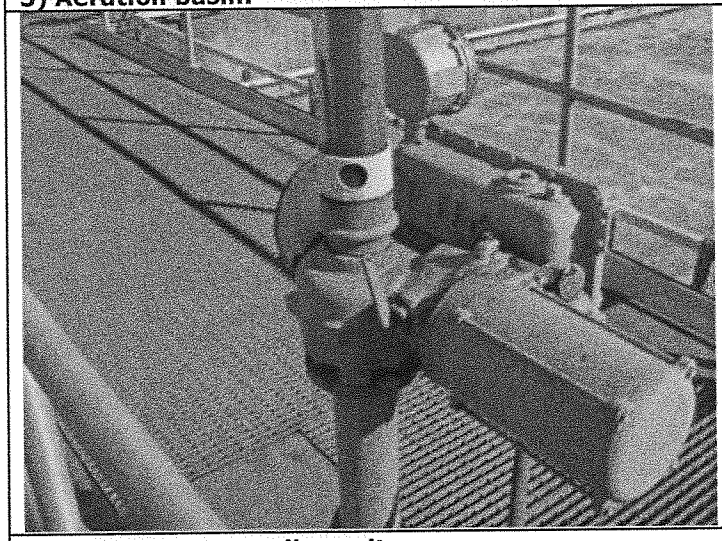
2) Vegetation on RAS pump station grate.



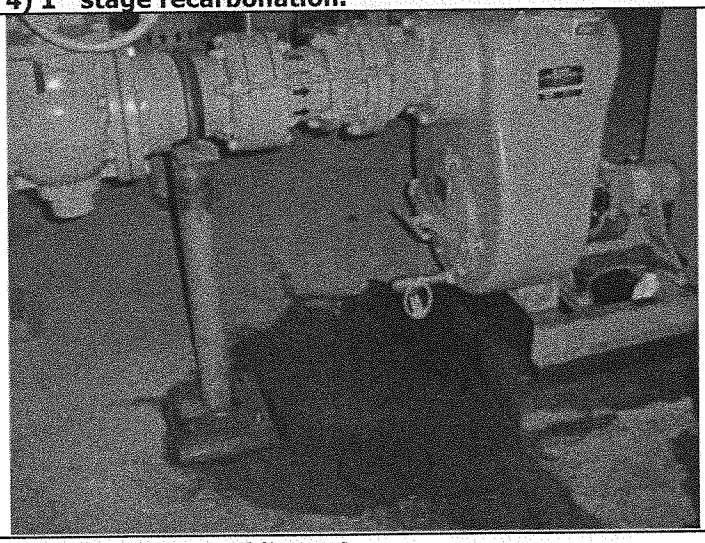
3) Aeration basin.



4) 1st stage recarbonation.

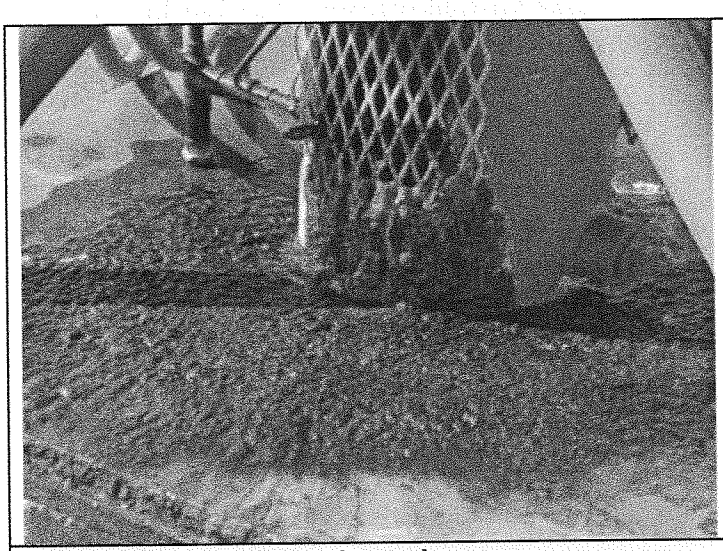


5) Grease on controller unit.

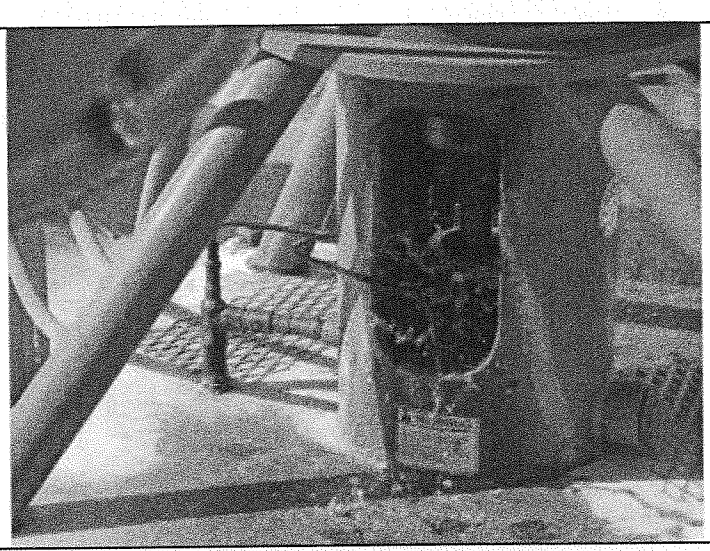


6) Pipe leak in building N2.

UOSA	Permit VA0024988
Photos by Terry Nelson	February 18, 2010
Layout by Terry Nelson	Page 1 of 3



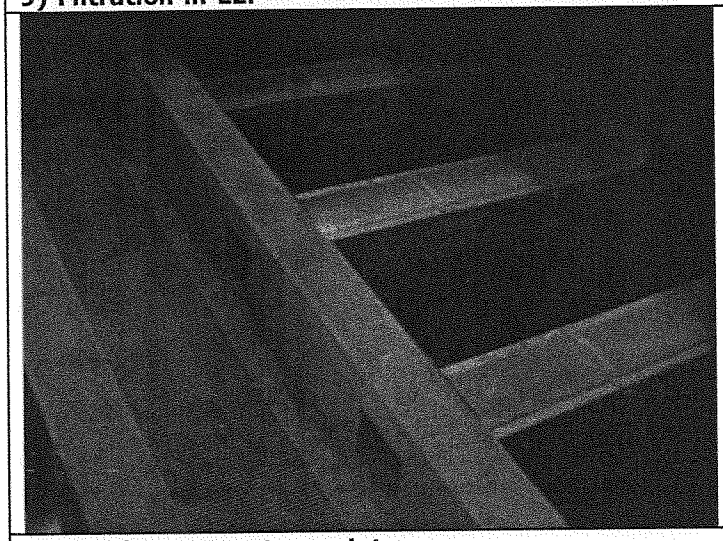
7) Minor leakage from L2 supply pump.



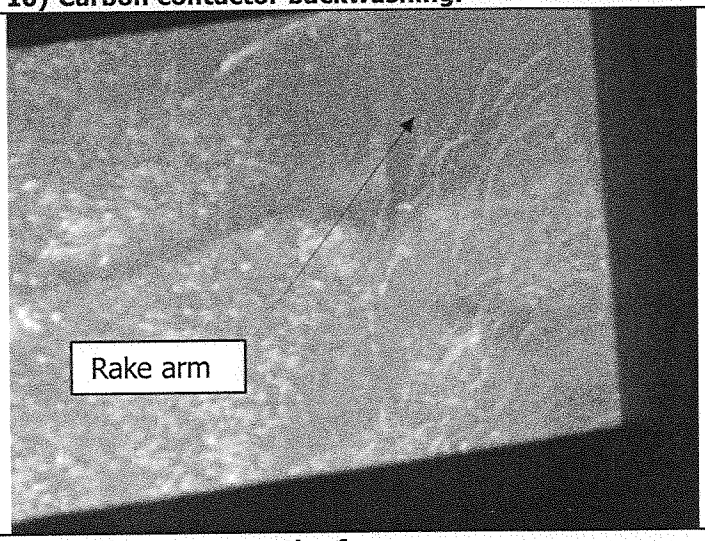
8) Significant leakage from L2 supply pump.

9) Filtration in L2.

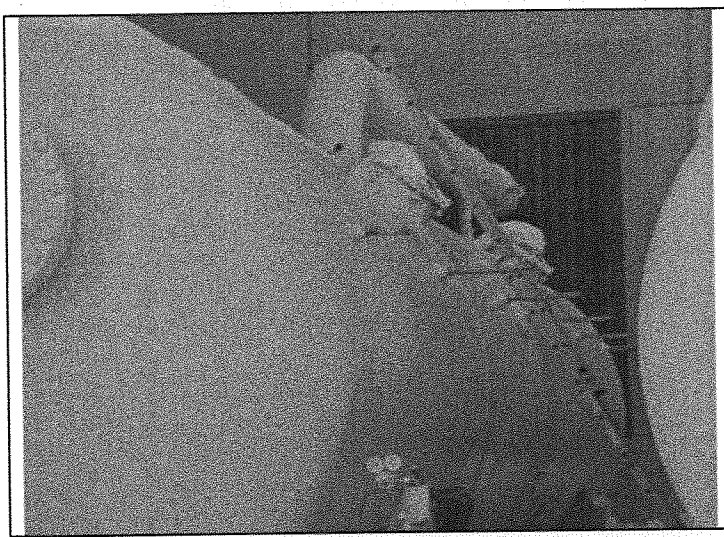
10) Carbon contactor backwashing.



11) Carbon contactor maintenance.

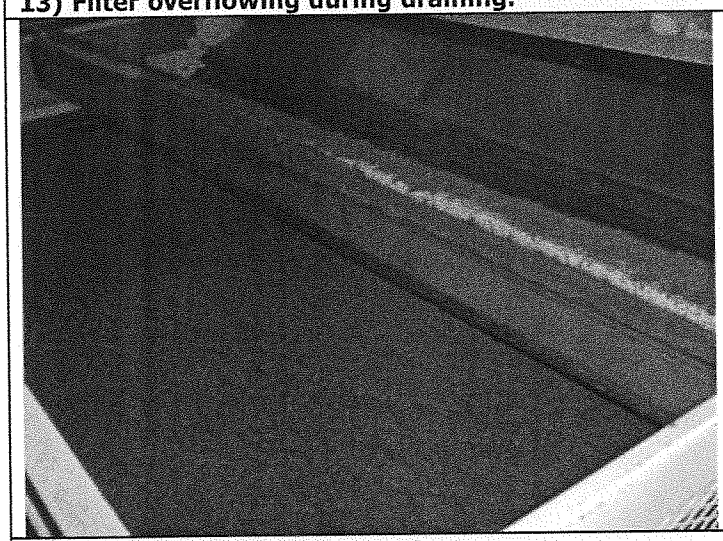


12) Carbon regeneration furnace.

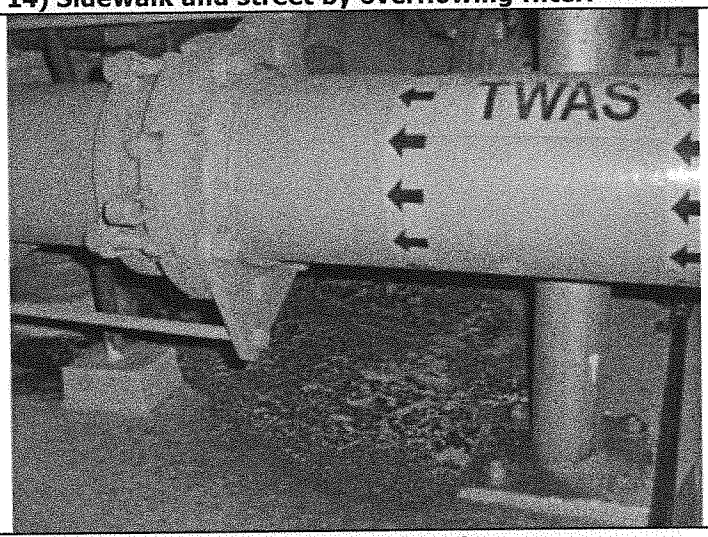


13) Filter overflowing during draining.

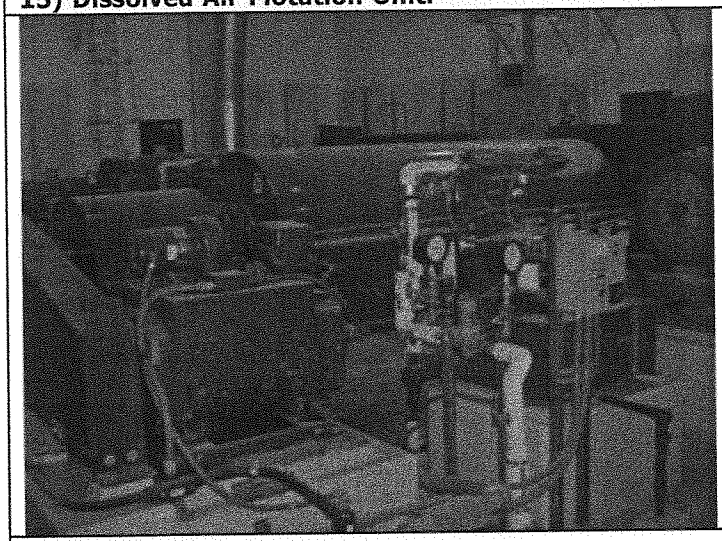
14) Sidewalk and street by overflowing filter.



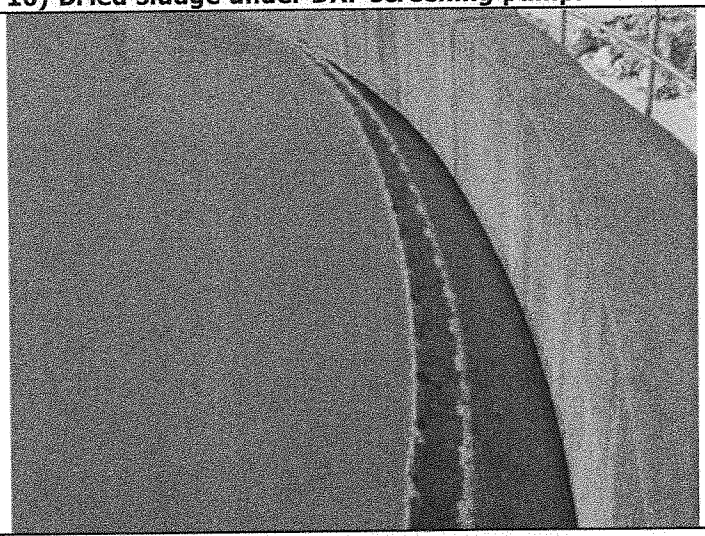
15) Dissolved Air Flotation Unit.



16) Dried sludge under DAF screening pump.



17) Centrifuges.



18) Gravity thickener with cloudy overflow.

Upper Occoquan Service Authority

Leader in Water Reclamation and Reuse

14631 COMPTON ROAD, CENTREVILLE, VIRGINIA 20121-2506 (703) 830-2200

Charles P. Boepple
Executive Director

Michael D. Reach
Deputy Executive Director

March 23, 2010

Mr. Terry Nelson
Environmental Specialist II
Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193

Re: Corrective Actions per DEQ Inspection of February 18, 2010

Dear Mr. Nelson:

Per your cover letter of March 1, 2010, UOSA took corrective action to address deficiencies noted in your wastewater facility inspection report. Photo's are noted and attached.

V-notch weir blockage on the primary sedimentation tanks were cleared (photo 1)

N/2 pipe leak was repaired (photo 2)

Dried sludge on floors under pumps was cleaned up (photo 3)

Grease leaks in the AWT chemical treatment section were addressed (photo 4)

Grate at the top of RAS pump station 9/2 was replaced with a plate (photo 5)

Leak repair at the vertical turbine pump seal water is underway (photo 6)

Algae growth at filter supply pump station 28/2 was cleaned (photo 7)

J/2 sludge pump seal water drip pan blockage was cleared (photo 8)

If you have any questions or need further assistance, please contact me at (703) 227-0235 or by e-mail at jack.sellman@uosa.org.

Sincerely,

John C. (Jack) Sellman
Director, Treatment Process

cc: CPB
EM
BLO
File

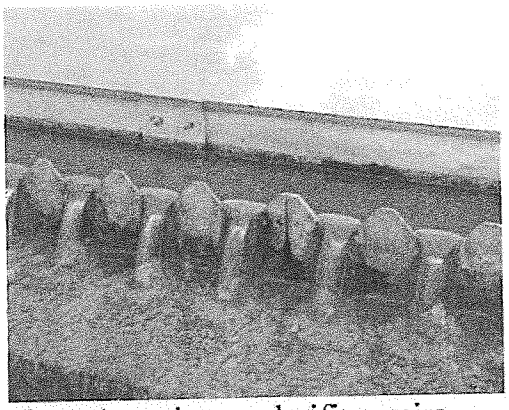


Photo 1 – primary clarifier weirs

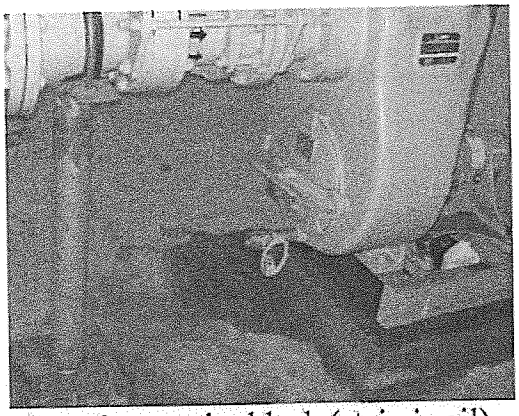


Photo 2 – repaired leak (stain is oil)

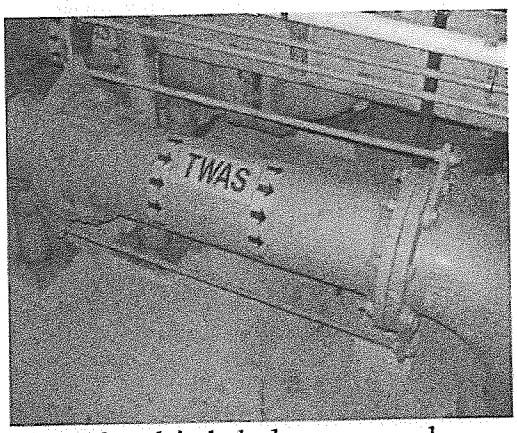


Photo 3 – dried sludge removed

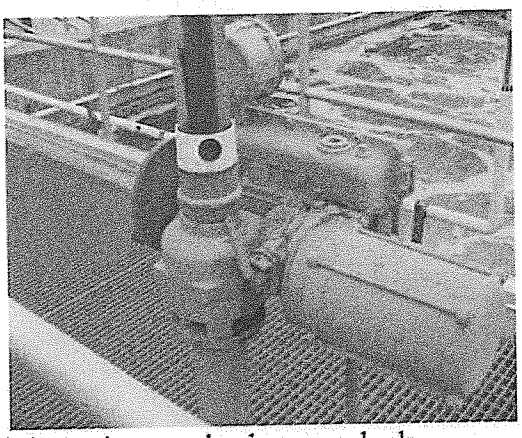


Photo 4 – repaired grease leak

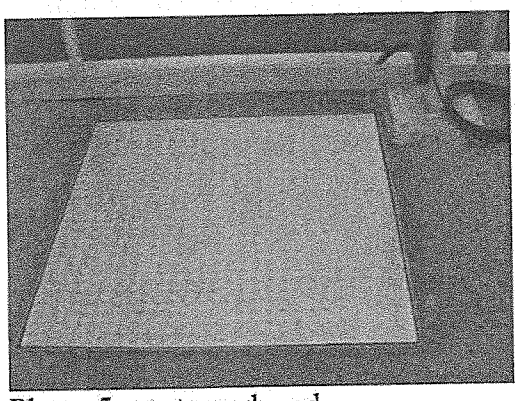


Photo 5- grate replaced

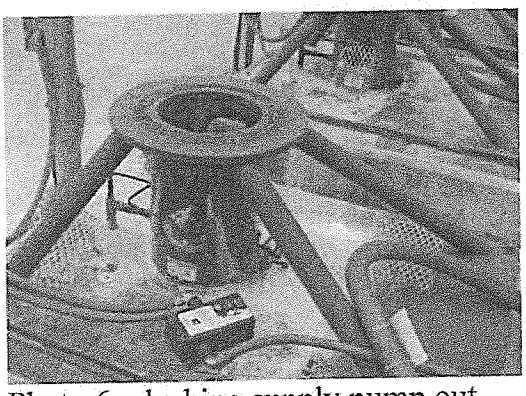


Photo 6 – leaking supply pump out for repair

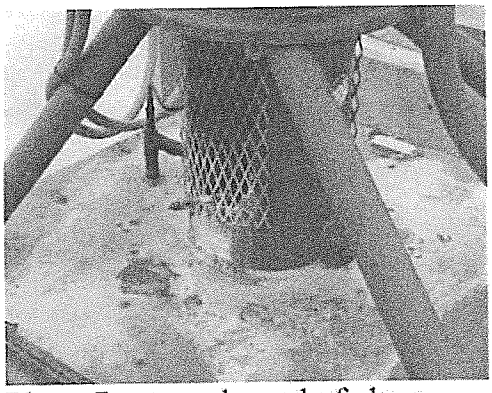


Photo 7 – area cleaned of algae

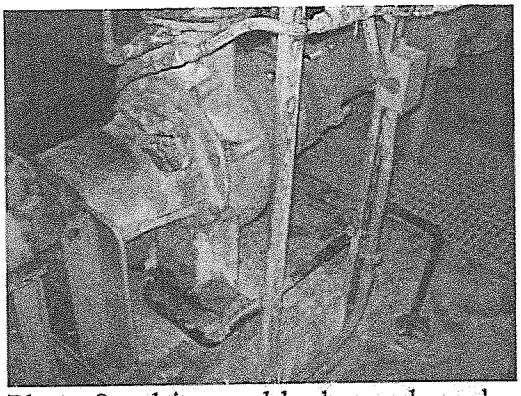


Photo 8 – drip pan blockage cleared

To:	Alison Thompson
From:	Katie Conaway
Date:	April 18, 2012
Subject:	Planning Statement for Upper Occoquan Service Authority
Permit Number:	VA0024988

Discharge Type:	Municipal, Major
Discharge Flow:	54 MGD with an expanded tier for 64 MGD
Receiving Stream:	Unnamed Tributary (XHL) to Bull Run
Latitude / Longitude:	38° 48' 19.0" N 77° 27' 31.7" W
Streamcode:	1aXHL
Waterbody:	VAN-A23R
Water Quality Standards:	Class III, Section 7a, Special Standards: g.
Rivermile:	0.41

1. Is there monitoring data for the receiving stream?

No.

- If yes, please attach latest summary.
- If no, where is the nearest downstream monitoring station.

The nearest downstream DEQ monitoring station with ambient data is Station 1aBUL010.28, located on Bull Run at the Route 28 bridge crossing. This station is located approximately 1.3 rivermiles downstream from the Outfall of VA0024988. The following is a monitoring summary for this station, as taken from the Draft 2012 Integrated Assessment:

Class III, Section 7a, special standard: g.

DEQ freshwater probabilistic monitoring station 1aBUL009.61, downstream from Route 28; ambient and biological monitoring station 1aBUL010.28, at Route 28, and biological station 1aBUL011.12, at upstream of Route 616.

The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. Additionally, an exceedance of the fish tissue value (TV) of 12 ppb for heptachlor epoxide that occurred in one specie (flathead catfish) in 2001 at monitoring station 1aBUL010.28, noted by an observed effect. An observed effect is also noted for an exceedance of the fish tissue value (TV) of 110 ppb for total chlordane that occurred in one specie (carp) in 2004.

Biological monitoring finds a benthic macroinvertebrate impairment, resulting in an impaired classification for the aquatic life use. A benthic TMDL for the Bull Run has been completed and approved.

The recreation and wildlife uses are considered fully supporting.

2. Is the receiving stream on the current 303(d) list?

No.

- If yes, what is the impairment?

  N/A

- Has the TMDL been prepared?

  N/A

- If yes, what is the WLA for the discharge?

  N/A

- If no, what is the schedule for the TMDL?

  N/A

3. If the answer to (2) above is no, is there a downstream 303(d) listed impairment?

Yes. The receiving stream (Unnamed Tributary to Bull Run) flows into Bull Run and there are several downstream impairments listed on Bull Run.

- If yes, what is the impairment?

  Aquatic Life Use Impairment (Benthic Macroinvertebrates): Two biological monitoring events in 2005 (1aBUL009.61, downstream of Route 28), and one biological monitoring event in 2005 (1aBUL010.28, at Route 28), and two biological monitoring events in 2005 (1aBUL011.12, upstream of Route 616) each resulted in a VSCI score which indicates an impaired macroinvertebrate community.

  Fish Consumption Use Impairment (PCBs in Fish Tissue): The fish consumption use is categorized as impaired due to a Virginia Department of Health, Division of Health Hazards Control, PCB fish consumption advisory. The advisory, dated 12/13/04 and modified 07/27/05, limits consumption of carp and channel catfish to no more than two meals per month. The affected area includes Bull Run near Manassas Park from the I-66 bridge downstream approximately fourteen miles to the Route 612 (Yates Ford Road) bridge.

- Has a TMDL been prepared?

  Aquatic Life Use Impairment: Yes.
  Fish Consumption Use Impairment for PCBs: No.

- Will the TMDL include the receiving stream?

  No. However, TMDLs consider all relevant upstream point source discharges.

- Is there a WLA for the discharge?

  Yes. The aquatic life use TMDL identified sediment as the most likely stressor on the Bull Run benthic community. VA0024988 was given a waste load allocation of **97.42 tons/year of sediment**.

  Also, please see the response to #4 below.

- What is the schedule for the TMDL?

  Aquatic Life Use TMDL – Approved by EPA September 26, 2006
  Fish Consumption Use TMDL (PCBs) – Scheduled for completion by 2016.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit? *Note here if you need a drainage area done or a list of Individual or General Permits found within the waterbody.*

   This facility also has a WLA for *E. coli* bacteria. Bull Run previously had a recreational use impairment for *E. coli* bacteria, and a TMDL was completed in 2006. Bull Run has subsequently been delisted for the recreational use; however, the TMDL WLA still remains in effect. UOSA was given a **WLA of 1.11 E+14 cfu/year of *E. coli* bacteria.**

   In addition, there is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

   Finally, In support of the PCB TMDL that will be developed for Bull Run in the coming years (estimated to be completed in 2016), this facility is a candidate for low-level PCB monitoring, based upon its designation as a major municipal facility. Low-level PCB analysis uses EPA Method 1668B, which is capable of detecting low-level concentrations for all 209 PCB congeners. The Assessment/TMDL Staff recommends that this facility perform low-level PCB monitoring during the upcoming permit cycle. TMDL Guidance Memo No. 09-2001 recommends that major municipal VPDES facilities collect 2 wet and 2 dry samples during the permit cycle, using EPA Method 1668, which is capable of detecting low-level concentrations for all 209 PCB congeners. During the interim period while EPA is undergoing the rulemaking process to promulgate EPA Method 1668C within 40 CFR, rather than requiring the most recent version of 1668 be utilized, Method 1668 revisions A, B, C or other revisions issued by EPA prior to final promulgation are acceptable for use.

5. Fact Sheet Requirements – Please provide information on other VPDES permits or VADEQ monitoring stations located within a 2 mile radius of the facility. In addition, please provide information on any drinking water intakes located within a 5 mile radius of the facility.

   There are several DEQ monitoring stations within a two mile radius of this facility:

   1aBUL011.12 (Bull Run, upstream from the Route 616 bridge crossing)
   1aBUL010.28 (Bull Run at the Route 28 bridge crossing)
   1aBUL009.61 (Bull Run, downstream from Route 28)
   1aLIP001.00 (Little Rocky Run at the Route 658 bridge crossing)
   1aCUB002.61 (Cub Run at the Route 658 bridge crossing)

There are no VPDES permitted facilities within a 2 mile radius of this facility. Also, there are no drinking water intakes within a 5 mile radius of this facility.

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Upper Occoquan Service Authority Permit No.: VA0024988

Receiving Stream: Bull Run, UT Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	mg/L
90% Temperature (Annual) =	deg C
90% Temperature (Wet season) =	deg C
90% Maximum pH =	SU
10% Maximum pH =	SU
Tier Designation (1 or 2) =	1
Public Water Supply (PWS) Y/N? =	n
Trout Present Y/N? =	n
Early Life Stages Present Y/N? =	y

Stream Flows

1Q10 (Annual) =	0 MGD
7Q10 (Annual) =	0 MGD
30Q10 (Annual) =	0 MGD
1Q10 (Wet season) =	0 MGD
30Q10 (Wet season)	0 MGD
30Q5 =	0 MGD
Harmonic Mean =	0 MGD

Mixing Information

Annual - 1Q10 Mix =	100 %
- 7Q10 Mix =	100 %
- 30Q10 Mix =	100 %
Wet Season - 1Q10 Mix =	100 %
- 30Q10 Mix =	100 %

Effluent Information

Mean Hardness (as CaCO3) =	113 mg/L
90% Temp (Annual) =	25 deg C
90% Temp (Wet season) =	15 deg C
90% Maximum pH =	7.5 SU
10% Maximum pH =	SU
Discharge Flow =	64 MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9.9E+02	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	9.9E+02
Acrolein	0	--	--	na	9.3E+00	--	--	na	9.3E+00	--	--	--	--	--	--	--	--	--	--	na	9.3E+00
Acrylonitrile [C]	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+00
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	3.0E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	3.0E+00	--	na	5.0E-04
Ammonia-N (mg/l) (Yearly)	0	1.99E+01	2.22E+00	na	--	1.99E+01	2.22E+00	na	--	--	--	--	--	--	--	--	--	1.99E+01	2.22E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	1.99E+01	4.23E+00	na	--	1.99E+01	4.23E+00	na	--	--	--	--	--	--	--	--	--	1.99E+01	4.23E+00	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.0E+04	--	--	--	--	--	--	--	--	--	--	na	4.0E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	6.4E+02	--	--	--	--	--	--	--	--	--	--	na	6.4E+02
Arsenic	0	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	5.1E+02
Benzidine [C]	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	2.0E-03
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+00
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+04
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	2.2E+01
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+03
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
Cadmium	0	4.5E+00	1.2E+00	na	--	4.5E+00	1.2E+00	na	--	--	--	--	--	--	--	--	--	4.5E+00	1.2E+00	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	1.6E+01
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.1E-03	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	na	8.1E-03
Chloride	0	8.6E+05	2.3E+05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+02
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+03
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	--	--	--	**8.3E-02**	**4.1E-02**	na	--
Chromium III	0	6.3E+02	8.2E+01	na	--	6.3E+02	8.2E+01	na	--	--	--	--	--	--	--	--	--	**6.3E+02**	**8.2E+01**	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	--	--	--	**1.6E+01**	**1.1E+01**	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene[C]	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	--	--	na	1.8E-02
Copper	0	1.5E+01	9.9E+00	na	--	1.5E+01	9.9E+00	na	--	--	--	--	--	--	--	--	--	**1.5E+01**	**9.9E+00**	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	--	--	--	--	--	--	--	--	**2.2E+01**	**5.2E+00**	na	**1.6E+04**
DDD[C]	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	--	--	na	**3.1E-03**
DDE[C]	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	--	--	na	**2.2E-03**
DDT[C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.2E-03	--	--	--	--	--	--	--	--	**1.1E+00**	**1.0E-03**	na	**2.2E-03**
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	**1.0E-01**	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.7E-01	1.7E-01	na	--	--	--	--	--	--	--	--	--	**1.7E-01**	**1.7E-01**	na	--
Dibenz(a,h)anthracene[C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	**1.8E-01**
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	--	--	na	**1.3E+03**
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	9.6E+02	--	--	--	--	--	--	--	--	--	--	na	**9.6E+02**
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.9E+02	--	--	--	--	--	--	--	--	--	--	na	**1.9E+02**
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	--	--	na	**2.8E-01**
Dichlorobromomethane[C]	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	**1.7E+02**
1,2-Dichloroethane[C]	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	**3.7E+02**
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	7.1E+03	--	--	--	--	--	--	--	--	--	--	na	**7.1E+03**
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	--	--	na	**1.0E+04**
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	2.9E+02	--	--	--	--	--	--	--	--	--	--	na	**2.9E+02**
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	**1.5E+02**
1,3-Dichloropropene[C]	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	--	--	na	**2.1E+02**
Dieldrin[C]	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.4E-04	--	--	--	--	--	--	--	--	**2.4E-01**	**5.6E-02**	na	**5.4E-04**
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	4.4E+04	--	--	--	--	--	--	--	--	--	--	na	**4.4E+04**
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	--	--	na	**8.5E+02**
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	--	--	na	**1.1E+06**
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	4.5E+03	--	--	--	--	--	--	--	--	--	--	na	**4.5E+03**
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	**5.3E+03**
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	2.8E+02	--	--	--	--	--	--	--	--	--	--	na	**2.8E+02**
2,4-Dinitrotoluene[C]	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	--	--	na	**3.4E+01**
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	5.1E-08	--	--	--	--	--	--	--	--	--	--	na	**5.1E-08**
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	--	--	na	**2.0E+00**
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	na	**8.9E+01**
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	8.9E+01	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	na	**8.9E+01**
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	**2.2E-01**	**5.6E-02**	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	--	--	--	na	**8.9E+01**
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.0E-02	--	--	--	--	--	--	--	--	**8.6E-02**	**3.6E-02**	na	**6.0E-02**
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.0E-01	--	--	--	--	--	--	--	--	--	--	na	**3.0E-01**

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.1E+03	--	--	--	--	--	--	--	--	--	--	na	2.1E+03
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.4E+02	--	--	--	--	--	--	--	--	--	--	na	1.4E+02
Fluorene	0	--	--	na	5.3E+03	--	--	na	5.3E+03	--	--	--	--	--	--	--	--	--	--	na	5.3E+03
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-02	na	--	--	--	--	--	--	--	--	--	--	1.0E-02	na	--
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	5.2E-01	3.8E-03	na	7.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	7.9E-04
Heptachlor Epoxide [C]	0	5.2E-01	3.8E-03	na	3.9E-04	5.2E-01	3.8E-03	na	3.9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	na	3.9E-04
Hexachlorobenzene [C]	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-03
Hexachlorobutadiene [C]	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+02
Hexachlorocyclohexane Alpha-BHC [C]	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-02
Hexachlorocyclohexane Beta-BHC [C]	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-01
Hexachlorocyclohexane Gamma-BHC [C] (Lindane)	0	9.5E-01	na	na	1.8E+00	9.5E-01	--	na	1.8E+00	--	--	--	--	--	--	--	--	9.5E-01	--	na	1.8E+00
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Hexachloroethane [C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+00	na	--	--	--	--	--	--	--	--	--	--	2.0E+00	na	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone [C]	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+03
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	1.4E+02	1.6E+01	na	--	1.4E+02	1.6E+01	na	--	--	--	--	--	--	--	--	--	1.4E+02	1.6E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	1.4E+00	7.7E-01	--	--	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+03
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-02	na	--	--	--	--	--	--	--	--	--	--	3.0E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	2.0E+02	2.2E+01	na	4.6E+03	2.0E+02	2.2E+01	na	4.6E+03	--	--	--	--	--	--	--	--	2.0E+02	2.2E+01	na	4.6E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	6.9E+02	--	--	--	--	--	--	--	--	--	--	na	6.9E+02
N-Nitrosodimethylamine [C]	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+01
N-Nitrosodiphenylamine [C]	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+01
N-Nitrosodi-n-propylamine [C]	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+00
Nonylphenol	0	2.8E+01	6.6E+00	--	--	2.8E+01	6.6E+00	na	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	6.5E-02	1.3E-02	na	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	na	--
PCB Total [C]	0	--	1.4E-02	na	6.4E-04	--	1.4E-02	na	6.4E-04	--	--	--	--	--	--	--	--	--	1.4E-02	na	6.4E-04
Pentachlorophenol [C]	0	7.7E-03	5.9E-03	na	3.0E+01	7.7E-03	5.9E-03	na	3.0E+01	--	--	--	--	--	--	--	--	7.7E-03	5.9E-03	na	3.0E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	8.6E+05	--	--	--	--	--	--	--	--	--	--	na	8.6E+05
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.0E+03	--	--	--	--	--	--	--	--	--	--	na	4.0E+03
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.2E+03	--	--	--	--	--	--	--	--	**2.0E+01**	**5.0E+00**	**na**	**4.2E+03**
Silver	0	4.3E+00	--	na	--	4.3E+00	--	na	--	--	--	--	--	--	--	--	--	**4.3E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+01**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+01**
Thallium	0	--	--	na	4.7E-01	--	--	na	4.7E-01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.7E-01**
Toluene	0	--	--	na	6.0E+03	--	--	na	6.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.0E+03**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	2.8E-03	--	--	--	--	--	--	--	--	**7.3E-01**	**2.0E-04**	**na**	**2.8E-03**
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	--	--	--	--	**4.6E-01**	**7.2E-02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.0E+01**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+02**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.0E+02**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+01**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+01**
Zinc	0	1.3E+02	1.3E+02	na	2.6E+04	1.3E+02	1.3E+02	na	2.6E+04	--	--	--	--	--	--	--	--	**1.3E+02**	**1.3E+02**	**na**	**2.6E+04**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.4E+02
Arsenic	9.0E+01
Barium	na
Cadmium	7.5E-01
Chromium III	4.9E+01
Chromium VI	6.4E+00
Copper	6.0E+00
Iron	na
Lead	9.5E+00
Manganese	na
Mercury	4.6E-01
Nickel	1.3E+01
Selenium	3.0E+00
Silver	1.7E+00
Zinc	5.2E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

7/5/2012 12:49:31 PM

Facility = UOSA
Chemical = TRC
Chronic averaging period = 4
WLAa = 0.019
WLAc = 0.011
Q.L. = .1
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = .2
Variance = .0144
C.V. = 0.6
97th percentile daily values = .486683
97th percentile 4 day average = .332758
97th percentile 30 day average= .241210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 1.60883226245855E-02
Average Weekly limit = 9.59676626920106E-03
Average Monthly LImit = 7.9737131838758E-03

The data are:

0.2

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Northern Regional Office
13901 Crown Court **Woodbridge, VA 22193** **(703) 583-3800**

SUBJECT: TOXICS MANAGEMENT PROGRAM (TMP) DATA REVIEW
Upper Occoquan Sewage Authority (VA0024988)
REVIEWER: Douglas Frasier
DATE: 15 July 2011

PREVIOUS REVIEW: 24 August 2010

DATA REVIEWED:

This review covers the fourth (4^{th}) annual chronic toxicity tests conducted in May 2011 at Outfall 001.

DISCUSSION:

The results of these toxicity tests, along with the results of previous toxicity tests conducted since 1997 on effluent samples collected at Outfall 001, are summarized in Table 1.

The chronic toxicity of effluent samples was determined with a 3-brood daily renewal survival and reproduction test using *C. dubia* and a 7-day daily renewal survival and growth test using *P. promelas*. These tests were performed using 24-hour flow-proportioned composite samples of final effluent.

Statistical analyses of the test results yielded a No Observed Effect Concentration (NOEC) of 100% effluent for *C. dubia* and *P. promelas*; thus passing the chronic toxicity criteria of 69%.

CONCLUSION:

The chronic toxicity tests are valid and the test results acceptable. The test results indicate that the effluent from Outfall 001 exhibits no chronic toxicity to *C. dubia* or *P. promelas*.

BIOMONITORING RESULTS

Upper Occoquan Sewage Authority (VA0024988)

Table 1

Summary of Toxicity Test Results for Outfall 001

TEST DATE	TEST TYPE/ORGANISM	IC_{25} (%)	48-HR LC_{50} (%)	NOEC (%)	% SURV	TU_c	REMARKS
07/08/97	Chronic *C. dubia*			100 SR	100		1st Annual
07/10/97	Acute *P. promelas*		>100		100		
07/09/98	Acute *P. promelas*		>100		100		2nd Annual
08/11/98	Chronic *C. dubia*			100 SR	100		
07/15/99	Acute *P. promelas*		>100		100		3rd Annual
07/13/99	Chronic *C. dubia*			100 SR	100		
07/13/00	Acute *P. promelas*		>100		100		4th Annual
07/11/99	Chronic *C. dubia*		>100		90		
07/11/01	Acute *P. promelas*		>100		100		5th annual
07/09/01	Chronic *C. dubia*	>100	>100	100 SR	90		
Permit Reissued February 19, 2002							
06/03/02	Chronic *C. dubia*	>100	>100	100 SR	90	1	1st Annual
06/03/02	Chronic *P. promelas*	>100	>100	100 SG	95	1	
07/07/03	Chronic *C. dubia*	>100	>100	100 SR	100	1	2nd Annual
07/07/03	Chronic *P. promelas*	>100	>100	100 SG	98	1	
06/07/04	Chronic *C. dubia*	>100	>100	100 SR	100	1	3rd Annual
06/07/04	Chronic *P. promelas*	>100	>100	100 SG	90	1	
06/06/05	Chronic *C. dubia*	88.4	>100	100 S **84.5 R**	80	**1.18**	4th Annual
06/06/05	Chronic *P. promelas*	>100	>100	100 SG	95	1	
03/06/06	Chronic *C. dubia*	>100	>100	100 SR	80	1	5th Annual
03/06/06	Chronic *P. promelas*	>100	>100	100 SG	90	1	
06/11/07	Chronic *C. dubia*	>100	>100	100 SR	100	1	
06/11/07	Chronic *P. promelas*	>100	>100	100 SG	98	1	
Permit Reissued 11 October 2007							
05/28/08	Chronic *C. dubia*	>100	>100	100 SR	90	1	1st Annual
05/28/08	Chronic *P. promelas*	>100	>100	100 S **85 G**	93	**1.18**	
06/09/09	Chronic *C. dubia*	>100	>100	100 SR	80	1	2nd Annual
06/09/09	Chronic *P. promelas*	>100	>100	100 SG	95	1	
06/02/10	Chronic *C. dubia*	>100	>100	100 SR	90	1	3rd Annual
06/02/10	Chronic *P. promelas*	>100	>100	100 SG	98	1	
05/23/11	Chronic *C. dubia*	>100	>100	100 SR	90	1	4th Annual
05/23/11	Chronic *P. promelas*	>100	>100	100 SG	100	1	

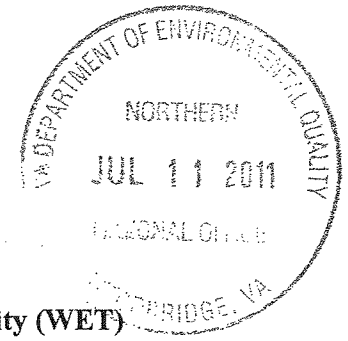
FOOTNOTES:

A **boldfaced** LC50 or NOEC value indicates that the test **failed** the criteria.
LC50 based on observation at the end of 48 hours.

ABBREVIATIONS:

S – Survival; R – Reproduction; G – Growth
INV – Invalid test
% SURV – Percent survival in 100% effluent
CBI – Coastal Bioanalysts, Incorporated

Client: Upper Occoquan Sewage Authority
Project ID: UOSA1101
Client Sample ID: Outfall 001
Permit No: VA0024988
Sample Period: 5/23/11 to 5/27/11



Coastal Bioanalysts, Inc.

Report of Analysis: Whole Effluent Toxicity (WET)

Submitted To:	**Prepared By:**
Mr. Bill Nivens Upper Occoquan Sewage Authority 14631 Compton Road Centreville, VA 20121-2506	Coastal Bioanalysts, Inc. 6400 Enterprise Court Gloucester, VA 23061 (804) 694-8285 www.coastalbio.com Contact: Peter F. De Lisle, Technical Director

Chronic Test Results*

Species-Test Method	Endpoint	NOEC	LOEC	ChrV	PMSD	$T.U._C$	IC25	48-h LC50	LC50 95% C.L.	$T.U._{Ac}$
C. dubia	Survival	100	>100	>100	N/A	1.00	N/A	>100	N/A	<1.00
EPA 1002.0	Reproduction	100	>100	>100	44	1.00	>100	N/A	N/A	N/A
P. promelas	Survival	100	>100	>100	N/A	1.00	N/A	>100	N/A	<1.00
EPA 1000.0	Biomass	100	>100	>100	12	1.00	>100	N/A	N/A	N/A

*Note: Details regarding test conduct and data analysis provided in attached bench sheets and printouts as applicable.

Chronic Test Biological Summary Data		Sample Concentration (%)					
Species-Method	Endpoint	Control	17.0	35.0	69.0	85.0	100
C. dubia EPA 1002.0	Survival (%):	90	100	90	100	70	90
	Repro (# young):	19.5	23.6	19.1	20.6	16.1	20.5
P. promelas EPA 1000.0	Survival (%):	100	98	100	98	98	100
	Biomass (mg):	0.781	0.697	0.778	0.753	0.754	0.775

Test Information Species-Method	Start Date/Time End Date/Time	Organism Source	Hatch/Harvest Date/Time	Acclimation Temp.	Acclimation Water	Test Aerated?
C. dubia	5/23/11 1525	CBI	5/22/11 1820		Mod. Hard	
EPA 1002.0	5/30/11 1400	Stock	5/22/11 2100	25° C	Syn. FW	No
P. promelas	5/23/11 1510	CBI	5/22/11 1630		Mod. Hard	
EPA 1000.0	5/30/11 1540	Stock	5/23/11 1000	25° C	Syn. FW	No

Sample/Dilution Water Data	Chronic Test			
	Sample		Dilution Water*	
Water Quality Parameter (Units)	Mean	Std. Dev.	Mean	Std. Dev.
Arrival Temperature (°C)	1	0	N/A	N/A
Use Temperature (°C)	25	0	25	0
Conductivity (µS/cm)	760	34	299	3.0
pH (S.U.)	7.79	0.08	7.65	0.03
Dissolved Oxygen (mg/l)	8.2	0	8.2	0
Total Hardness (mg/l as $CaCO_3$)	197	8.1	97	6.8
Alkalinity (mg/l as $CaCO_3$)	97	2.0	59	1.5
Total Residual Chlorine (mg/l)	<Q.L.	0	N/A	N/A
Ammonia (mg/l NH_3-N)	<1.0	0	N/A	N/A

*Dilution water = Moderately hard synthetic freshwater

VELAP# 460030
EPA# VA01116

Client: Upper Occoquan Sewage Authority
Project ID: UOSA1101
Client Sample ID: Outfall 001
Permit No: VA0024988
Sample Period: 5/23/11 to 5/27/11

Coastal Bioanalysts, Inc.

Sample Aging/Use/Pretreatment				
CBI Sample I.D.	Collection Date/Time	Date(s)/Time(s) 1st Used in Tests	Date(s)/Time(s) Used in Renewals	Sample Adjustments
UOSA1101-A	5/23/11 0758	5/23/11 1510, 1525	5/24/11 1405, 1420	Aerated 3.5-4 min
UOSA1101-B	5/25/11 0749	5/25/11 1510, 1600	5/26/11 1450, 1500	Aerated 4 min
UOSA1101-C	5/27/11 0752	5/27/11 1545, 1550	5/28/11 1430, 1525 5/29/11 1355, 1500	Aerated 3-5.5 min

Chronic Test Water Quality (Mean/Std. Dev.)												
Test:	*C. dubia* 1002.0						*P. promelas* 1000.0					
% Conc:	Cont.	17.0	35.0	69.0	85.0	100	Cont.	17.0	35.0	69.0	85.0	100
Temp. (°C)	25 0.3	25 0.3	25 0.3	25 0.3	25 0.3	25 0.3	25 0.3	25 0.3	25 0.3	25 0.3	25 0.3	25 0.3
D.O. (mg/l)	8.0 0.2	7.9 0.3	7.9 0.3	7.9 0.3	7.9 0.3	7.9 0.3	7.3 1.0	7.3 1.0	7.3 1.0	7.4 0.9	7.4 0.9	7.4 0.9
pH (S.U.)	7.61 0.07	7.64 0.04	7.68 0.03	7.75 0.04	7.80 0.05	7.82 0.06	7.38 0.26	7.42 0.27	7.47 0.26	7.57 0.23	7.61 0.20	7.65 0.20
Cond. (µS/cm)	296 4.3	375 9.6	458 13	620 19	699 27	766 28	295 4.5	376 7.0	463 11	625 20	705 24	777 28

Chronic Test QA/QC Reference Toxicant: KCl Units: mg/l Test Organism Source: CBI Stock Cultures									
Species-Method (Ref. Test Date)	Data Source	% Survival		Reproduction (# Young) or Biomass (mg)					RTT in Control?
		Cont.	NOEC	Cont.	NOEC	PMSD	IC25	IC25 A.L.	
C. dubia 1002.0	RTT	100	250	25.0	250	25	341	N/A	Yes
(5/4/11-5/11/11)	CC	99	500	24.0	250	25	310	233-388	
P. promelas 1000.0	RTT	100	500	0.67	500	18	632	N/A	Yes
(5/2/11-5/9/11)	CC	98	500	0.77	500	16	599	555-643	

Note: RTT = Reference Toxicant Test, CC = Control Chart, Cont. = Control group.

The results of analysis contained within this report relate only to the sample as received in the laboratory. This report shall not be reproduced except in full without written approval from the laboratory. Unless noted below, these test results meet all requirements of NELAP.

APPROVED:

Peter F. De Lisle, Ph.D.
Technical Director

6/1 /11
Date

Deviations from, additions to, or exclusions from the test method, non-standard conditions or data qualifiers and, as appropriate, a statement of compliance/non-compliance: **NONE**

GLOSSARY OF TERMS AND ABBREVIATIONS

A.L. (Acceptance Limits): The results of a given reference toxicant test are compared to the control chart mean value ± 2 standard deviations. These limits approximate the 95% probability limits for the "true" reference toxicant value.

VELAP# 460030
EPA# VA01116

Coastal Bioanalysts, Inc.

Chronic Value (ChrV): The geometric mean of the NOEC and LOEC. Units are same as test concentration units.

C.L. (Confidence Limits): These are the probability limits, based on the data set and statistical model employed, that the "true value" lies within the limits specified. Typically limits are based on 95% or 99% probabilities.

Control chart: A cumulative summary chart of results from QC tests with reference toxicants. The results of a given reference toxicant test are compared to the control chart mean value and 95% Acceptance Limits (A.L.) (mean $\pm$ 2 standard deviations).

IC25: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 25% reduction in test organism growth, reproduction, etc. The lower the IC25, the more toxic the chemical or sample. Units are same as test concentration units.

LC50: The concentration of sample or chemical, calculated from the data set using statistical models, causing a 50% reduction in test organism survival. The lower the LC50, the more toxic the chemical or sample. Units are same as test concentration units. Note: The LC50 value must always be associated with the duration of exposure. Thus 48-h LC50, 96-h LC50, etc. are calculated.

LOEC: Lowest-observable-effect-concentration. The lowest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit a statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Units are same as test concentration units.

PMSD: Percent Minimum Significant Difference: The minimum difference which can exist between a test treatment and the controls in a particular test and be statistically significant; a measure of test sensitivity. The lower the PMSD the more sensitive the test.

N/A: Not applicable.

N/D: Not determined or measured.

NOAEC: No-observable-acute-effect-concentration. The highest concentration of sample or chemical in an acute test dilution series in which the test organisms exhibit no statistically significant reduction in the test end point (e.g. survival) compared to control organisms. Units are same as test concentration units.

NOEC: No-observable-effect-concentration. The highest concentration of sample or chemical in a chronic test dilution series in which the test organisms exhibit no statistically significant reduction in any of the test end points (e.g. growth, survival, reproduction) compared to control organisms. Some regulatory definitions also require that the NOEC be less than the LOEC. Units are same as test concentration units.

Q.L.: Quantitation Limit. Level, concentration, or quantity of a target variable (analyte) that can be reported at a specified degree of confidence.

T.U.: Toxic units. Expresses the relative toxicity of an effluent in such a manner that the larger the toxic unit value the more toxic the effluent. $T.U._{Ac} = 100/LC50$. $T.U._{Chr} = 100/NOEC$ or $100/IC25$. A dimensionless unit.

VELAP# 460030
EPA# VA01116

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 01/10/05
File: WETLIM10.xls
(MIX.EXE required also)

Acute Endpoint/Permit Limit — Use as LC_{50} in Special Condition, as TUa on DMR

ACUTE 100% = NOAEC LC_{50} = NA % Use as NA TUa

ACUTE WLAa 0.30088889 Note: Inform the permittee that if the mean of the data exceeds this TUa: 1.0 a limit may result using WLA.EXE

Chronic Endpoint/Permit Limit — Use as NOEC in Special Condition, as TUc on DMR

CHRONIC	1.470158405	TU_c	NOEC =	69 %	Use as	1.44	TU_c
BOTH*	3.008888963	TU_c	NOEC =	34 %	Use as	2.94	TU_c
AML	1.470158405	TU_c	NOEC =	69 %	Use as	1.44	TU_c

ACUTE WLAa,c 3.00888889
CHRONIC WLAc 1.00518519
* Both means acute expressed as chronic

Note: Inform the permittee that if the mean of the data exceeds this TUc: 1.0 a limit may result using WLA.EXE

Enter data in the cells with blue type:

Entry Date: 08/07/12
Facility Name: UOSA
VPDES Number: VA0024988
Outfall Number: 1

% Flow to be used from MIX.EXE

Difuser /modeling study? Enter Y/N N

Plant Flow: 54 MGD
Acute 1Q10: 0.16 MGD 100 % Acute 1 :1
Chronic 7Q10: 0.28 MGD 100 % Chronic 1 :1

Are data available to calculate CV? (Y/N) N (Minimum of 10 data points, same species, needed) Go to Page 2
Are data available to calculate ACR? (Y/N) N (NOEC<LC50, do not use greater/less than data) Go to Page 3

IWC_a	99.70457903 %	Plant flow/plant flow + 1Q10	NOTE: If the IWCa is >33%, specify the NOAEC = 100% test/endpoint for use
IWC_c	99.48415623 %	Plant flow/plant flow + 7Q10	
Dilution, acute	1.002962963	100/IWCa	
Dilution, chronic	1.005185185	100/IWCc	
WLA_a	0.300888889	Instream criterion (0.3 TUa) X's Dilution, acute	
WLA_c	1.005185185	Instream criterion (1.0 TUc) X's Dilution, chronic	
$WLA_{a,c}$	3.008888889	ACR X's WLA_a - converts acute WLA to chronic units	
ACR -acute/chronic ratio	10	LC50/NOEC (Default is 10 - if data are available, use tables Page 3)	
CV-Coefficient of variation	0.6	Default of 0.6 - if data are available, use tables Page 2)	
Constants eA	0.4109447	Default = 0.41	
eB	0.6010373	Default = 0.60	
eC	2.4334175	Default = 2.43	
eD	2.4334175	Default = 2.43 (1 samp) No. of samples: 1	

**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTAa,c and MDL using it are driven by the ACR.

$LTA_{a,c}$	1.236486942	WLAa,c X's eA						
LTA_c	0.60415379	WLAc X's eB					Rounded NOEC's	%
MDL** with $LTA_{a,c}$	3.008888963	TU_c	NOEC =	33.234859	(Protects from acute/chronic toxicity)		NOEC =	34 %
MDL** with LTA_c	1.470158405	TU_c	NOEC =	68.019881	(Protects from chronic toxicity)		NOEC =	69 %
AML with lowest LTA	1.470158405	TU_c	NOEC =	68.019881	Lowest LTA X's eD		NOEC =	69

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM TU_c to TU_a

							Rounded LC50's	%
MDL with $LTA_{a,c}$	0.300888896	TU_a	LC50 =	332.348589 %	Use NOAEC=100%		LC50 = NA	%
MDL with LTA_c	0.14701584	TU_a	LC50 =	680.198812 %	Use NOAEC=100%		LC50 = NA	

Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">") FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE 'CV' WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE 'CV' IS ANYTHING OTHER THAN 0.6.

Coefficient of Variation for effluent tests

CV = 0.6 (Default 0.6)

δ^2 = 0.3074847

δ = 0.554513029

Using the log variance to develop eA
(P. 100, step 2a of TSD)

Z = 1.881 (97% probability stat from table

A = -0.88929666

eA = 0.410944686

Using the log variance to develop eB
(P. 100, step 2b of TSD)

δ_4^2 = 0.086177696

δ_4 = 0.293560379

B = -0.50909823

eB = 0.601037335

Using the log variance to develop eC
(P. 100, step 4a of TSD)

δ^2 = 0.3074847

δ = 0.554513029

C = 0.889296658

eC = 2.433417525

Using the log variance to develop eD
(P. 100, step 4b of TSD)

n = 1 This number will most likely stay as "1", for 1 sample/month.

δ_n^2 = 0.3074847

δ_n = 0.554513029

D = 0.889296658

eD = 2.433417525

	Vertebrate IC_{25} Data or LC_{50} Data **********	LN of data		Invertebrate IC_{25} Data or LC_{50} Data **********	LN of data
1	0		1	0	
2			2		
3			3		
4			4		
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
16			16		
17			17		
18			18		
19			19		
20			20		

St Dev	NEED DATA	NEED DATA	St Dev	NEED DATA	NEED DATA	
Mean	0	0	Mean	0	0	
Variance	0	0.000000	Variance	0	0.000000	
CV	0		CV	0		

Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC_{50}, since the ACR divides the LC_{50} by the NOEC. LC_{50}'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Table 1. Result:	Vertebrate ACR	0
Table 2. Result:	Invertebrate ACR	0
	Lowest ACR	Default to 10

Table 2. ACR using Invertebrate data

Set #	LC_{50}	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use
1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA
				ACR for vertebrate data:			0

Convert LC_{50}'s and NOEC's to Chronic TU's for use in WLA.EXE

Table 3. ACR used: 10

	Enter LC_{50}	TUc	Enter NOEC	TUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC50, enter it here: NO DATA $\%LC_{50}$

NO DATA TUa

DILUTION SERIES TO RECOMMEND

Table 4.

	Monitoring		Limit	
	% Effluent	TUc	% Effluent	TUc
Dilution series based on data mean	100	1.0		
Dilution series to use for limit			69	1.4492754
Dilution factor to recommend:	0.5		0.8306624	
Dilution series to recommend:	100.0	1.00	100.0	1.00
	50.0	2.00	83.1	1.20
	25.0	4.00	69.0	1.45
	12.5	8.00	57.3	1.74
	6.25	16.00	47.6	2.10
Extra dilutions if needed	3.12	32.05	39.5	2.53
	1.56	64.10	32.9	3.04

Cell: I9
Comment:
This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18
Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22
Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40
Comment:
If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41
Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48
Comment:
See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G62
Comment:
Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62
Comment:
Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117
Comment: Vertebrates are:

Pimephales promelas
Cyprinodon variegatus

Cell: M119
Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121
Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUa. The calculation is the same: 100/NOEC = TUc or 100/LC50 = TUa.

Cell: C138
Comment: Invertebrates are:

Ceriodaphnia dubia
Mysidopsis bahia

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Fairfax County, Virginia.

PUBLIC COMMENT PERIOD: XXX, 2012 to 5:00 p.m. on XXX, 2012

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Upper Occoquan Service Authority, 14631 Compton Rd, Centreville, VA 20121-2506, VA0024988

NAME AND ADDRESS OF FACILITY: Upper Occoquan Service Authority, 14631 Compton Rd, Centreville, VA 20121-2506

PROJECT DESCRIPTION: Upper Occoquan Service Authority has applied for a reissuance of a permit for the public Upper Occoquan Service Authority. The applicant proposes to release treated sewage wastewaters from residential areas and treated industrial wastewaters at a rate of 54 million gallons per day into a water body. A 64 million gallons per day flow tier is also included in the permit. The sludge will be disposed by land application. The facility proposes to release the treated sewage into an unnamed tributary to Bull Run in Fairfax County in the Potomac watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, Chemical Oxygen Demand, Total Suspended Solids, Total Phosphorus, Total Kjeldahl Nitrogen, Total Residual Chlorine, E. coli, MBAS, Dissolved Oxygen, and Turbidity. The facility shall also monitor for Total Nitrogen and Whole Effluent Toxicity.

This facility is subject to the requirements of 9VAC25-820 and has registered for coverage under the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the documents at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.
Name: Alison Thompson
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3834 E-mail: Alison.Thompson@deq.virginia.gov Fax: (703) 583-3821

Revised 2/2003

State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	Upper Occoquan Service Authority
NPDES Permit Number:	VA0024988
Permit Writer Name:	Alison Thompson
Date:	8/8/2012

Major [X] **Minor** [ ] **Industrial** [ ] **Municipal** [X]

I.A. Draft Permit Package Submittal Includes:	**Yes**	**No**	**N/A**
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?	X		
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?	X		
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations? No model run – Occoquan Policy limits.		X	
8. Whole Effluent Toxicity Test summary and analysis?	X		
9. Permit Rating Sheet for new or modified industrial facilities?			X

I.B. Permit/Facility Characteristics	**Yes**	**No**	**N/A**
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet **or** permit contain a description of the wastewater treatment process?	X		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?		X	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet **or** permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?	X		
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit? 2016 for PCBs		X	
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	X		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?		X	

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs
(To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

II.C. Technology-Based Effluent Limits (POTWs)	Yes	No	N/A
1. Does the permit contain numeric limits for ALL of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?	X		
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a "reasonable potential" evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	X		
e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?	X		

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?	X		

II.F. Special Conditions – cont.	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?	X		

II.G. Standard Conditions	Yes	No	N/A
1. Does the **permit** contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		

List of Standard Conditions – 40 CFR 122.41

Duty to comply	Property rights	Reporting Requirements
Duty to reapply	Duty to provide information	Planned change
Need to halt or reduce activity not a defense	Inspections and entry	Anticipated noncompliance
	Monitoring and records	Transfers
Duty to mitigate	Signatory requirement	Monitoring reports
Proper O & M	Bypass	Compliance schedules
Permit actions	Upset	24-Hour reporting
		Other non-compliance

2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	X		

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	Alison Thompson
Title	Water Permits Technical Reviewer
Signature	
Date	8/8/12